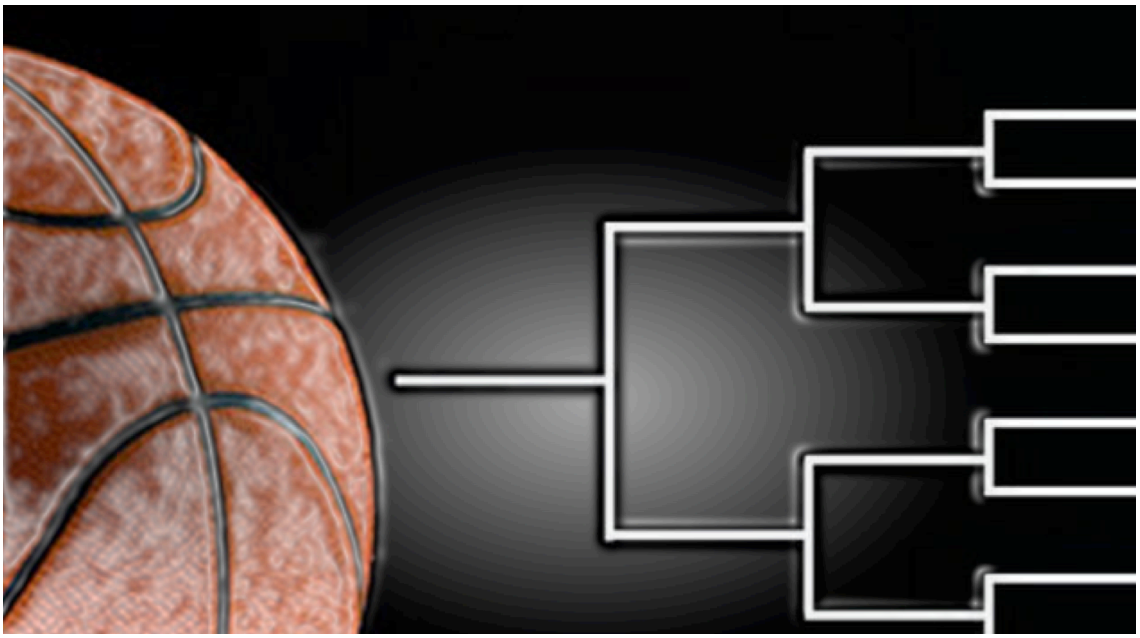
Summer 2016 | June 20-23



Basketball Bracketology

Durham Public Schools

Grades 6-8

Do you want to conquer March Madness bracketology? In this class, you will learn the basics of basketball statistics. The week will culminate with the creation of an interactive spreadsheet to more accurately predict the winner of the NCAA Championship!

James.shafto@dpsnc.net www.giftedellatneal.weebly.com

Rationale

Every year, NCAA basketball fans create brackets that will predict the final results of the NCAA national college basketball tournament. Since 2002, a man named Ken Pomroy has been using statistics to analyze historical data and use it to predict the future of what will occur in individual basketball games. In the past seven years, basketball analytics has moved out of the arena of scientists and statisticians and has begun to strongly influence the world of sports and spectators. Many amateur statisticians have aspired to recreate the results of the Hollywood movie "Money Ball" featured the coach of the Oakland A's using baseball statistics to build a team that made an unprecedented run for the World Series. This use of statistics has taken analysis out the field of geeks and scientist and brought it directly into immediate application in the field of sports, coaching, recruiting, prediction and fantasy basketball.

Basketball statistics is unique in that it takes two things which students love, sports and the future and applies mathematical principles to an idea prevalent in Social Studies, that "history informs prediction." Students will learn what statistics are available to the public, and will create a handbook which uses history to inform predictions of individual basketball games, leading to an overall production of the final result of the NCAA tournament. As students are creating their handbooks, they will use Socratic Seminar's and TABA concept development to collaboratively delve into high-level statistical analysis. The activities and mini lessons will guide students to develop an understanding of analytics not only for the sake of prediction, but also for application on the field by coaches and players.

Skill-wise, the set-up of the performance task allows students to apply various levels of mathematical ability to accurately predicting the winners of the NCAA tournament. Students can develop a strategy which is as simple as applying somebody else's statistics, or use ratios and pre-existing rankings to design their own systematic strategy.

Differentiation for Gifted Learners

1. Content – The content for this unit is selected by students (they chose to be in the class) and is correlated with their interests. As such, for the most part - with the exception of the students whose parents force them to take the classes - students will have high interest and will be engaged in various levels of mathematical rigor. If they choose to do so, students can delve into high school statistics, or they can simply apply complex ratios. The instructor is responsible for ensuring that each student is pushed to think critically about his or her respective strategy.
2. Process – students will be given opportunities to engage with research-based instructional practices such as TABA concept development, Socratic Seminar's, and simulations. These processes will allow students to express themselves in unique and individualized ways while collaborating towards the common goal of understanding how history informs prediction.
3. Product – students are asked to make a handbook that will help a wealthy client predict winners of the NCAA tournament. This product can be in the form of a printed out handbook, flowchart, excel spreadsheet, or any other avenue of creative and intellectual expression. The nature of the product allows for increasing depth and complexity according to student ability and desire. The teacher should challenge student thought throughout the

camp to ensure students are thinking critically and using historical data to inform their predictions as they adjust their handbook procedures.

4. Learning environment – this unit is designed for spark camp, which is only open to students who are identified as academically gifted. As such, the students are in an environment among like peers who challenge them to higher levels of critical thinking.

Goals and Outcomes

Essential Understandings

- History Informs prediction

Essential Questions

- How does history inform prediction?

Content goal: Students understand that history informs prediction.

Students will be able to

a. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. Specifically, students will use Ken Pomroy data, AP poll data, and Coaches poll data to weigh predictions based off weights given to historical occurrences. CCSS.MATH.CONTENT.HSS.MD.B.5
b. Use probabilities to make fair decisions. More specifically, students will use the probabilities mentioned in "a" to make informed decisions. CCSS.MATH.CONTENT.HSS.MD.B.6
c. Analyze decisions and strategies using probability concepts. More specifically, students will adjust their probability models based off it's accuracy with respect to historical data. CCSS.MATH.CONTENT.HSS.MD.B.7

2. Process goal

Students will be able to

a. construct viable arguments and critique the reasoning of others. Each class, they will present their models of prediction and offer suggestions for to their peers for improvement. CCSS.MATH.PRACTICE.MP3
b. model with mathematics. Each performance task is a systematic strategy, which predicts the NCAA tournament winners using historical data. CCSS.MATH.PRACTICE.MP4
c. use appropriate tools strategically. Students will need to select which historical data to use as well as which mathematical models they will choose to analyze the data. CCSS.MATH.PRACTICE.MP5

3. Concept goal

Students will be able to

a. Understand how history informs prediction.
b. Analyze history to inform prediction.
c. Explain how statistics can be used to show how history informs prediction.

IV. Assessment Plan – Work samples at attached to lesson plans.

	Formative	Summative
Day 1	- Throughout the lesson, the teacher should ask student groups guiding questions and listen to responses and discussions. Provide hints and suggestions as needed. -	End of class - Students will write at least one paragraph explaining the relationship between historical data and prediction. They will then share what they wrote.
Day 2	- Throughout the lesson, the teacher should ask student groups guiding questions and listen to responses and discussions. Provide hints and suggestions as needed. - As part of the bracket challenge, ensure that students are adjusting their prediction strategies based on the data they receive from the bracket challenge.	In their groups students will be given the data from the final 4 matchups of the 2007 NCAA tournament. They will be asked to predict winners based off previous discussions of historical data. Task: Make a prediction about this game. Who will win? How did you use history to make your prediction? Students self-assess their predictions using the actual winning bracket, then input their score into the game sheet. Students begin working on the final performance task.
Day 3	- Throughout the lesson, the teacher should ask student groups guiding questions and listen to responses and discussions. Provide hints and suggestions as needed. - As part of the bracket challenge, ensure that students are adjusting their prediction strategies based on the data they receive from the bracket challenge.	Students get together and adjust their prediction systems and work on the performance task. Students use their handbook predict a bracket from another year. The teacher will give students the data, just like on day 1 and day 2. Students will also be given money to bet on the best handbook. The winning group explains their reasoning and what steps they used to decide the winners.
Day 4	- Throughout the lesson, the teacher should ask student groups guiding questions and	Evaluation of performance task using rubric. Parents will be present and students

	listen to responses and discussions. Provide hints and suggestions as needed. Push students to think critically and dive deeper into the mathematics as they finish their performance task.	will present their handbooks. Final monetary allotments will be declared and winners will be awarded prizes based off the money students earned from bidding on and winning the bracket challenge.

Performance Task - Summative Assessment Day 1- 4

You are a basketball statistician who has been hired by a wealthy basketball fanatic. Your task is to use history and prediction to write a procedural manual which your client will use to more accurately predict the results of the NCAA basketball tournament, and ultimately, win the bracket challenge.

Points	4	3	2	1
Conceptual understanding	The handbook demonstrates clear conceptual understanding of how history informs prediction.	The handbook demonstrates loose understanding of how history informs prediction.	The handbook alludes to how history informs prediction but does not convincingly communicate the student's understanding.	The handbook demonstrates little to no understanding of how history informs prediction.
Application of content knowledge	3/3 of the following: The handbook __Clearly demonstrates understanding of basketball statistics strategies __Selects appropriate historical data to inform prediction. __ Uses a systematic procedure for selecting game winners.	2/3 of the following: The handbook __Clearly demonstrates understanding of basketball statistics strategies __Selects appropriate historical data to inform prediction. __ Uses a systematic procedure for selecting game winners.	1/3 of the following: The handbook __Clearly demonstrates understanding of basketball statistics strategies __Selects appropriate historical data to inform prediction. __ Uses a systematic procedure for selecting game winners.	The handbook Demonstrates little to no understanding of basketball statistics strategies Does not use history to inform predictions Does not use a systematic procedure for selecting game winners.
Organization and presentation	The procedure manual is concisely written and documents step-by-step instructions, which culminate in a complete bracket prediction.	The handbook has step-by-step instructions that culminate in a complete bracket but is difficult to follow.	The handbook alludes to step-by-step instructions, and is difficult to follow	The handbook is incomplete or extremely vague.
Collaboration	The student contributed 50% of the presentation and creation of the handbook.	The student's contribution to the handbook could be estimated between 30 and 40%.	The student's contribution to the handbook could be estimated between 20 and 30%.	The student did less than 20% of the work on the handbook.
Participation	The student participated in all learning activities.	The student participated in learning activities on 3/4 days.	The student participated in learning activities on 2/4 days.	The student participated in learning activities on 1 day or no days.

V. Lesson Plans

VI. Unit Resources (Suggested length: 2 – 5 pages)

Provide a listing of books, Web sites, videos, and/or other instructional materials that are intended to supplement the unit. Include resources intended for both teacher and student use. Be sure to use APA style for books/articles and provide a brief (1-2 sentence) annotation for Web sites and instructional materials.

Resource	Location	Use
Ken Pomeroy Statistics	http://kenpom.com/	Ken Pomeroy is one of the foremost basketball statisticians and has been using the four factors to predict NCAA tournament since 2002.
AP Poll	http://collegebasketball.ap.org/poll	The AP poll is a groupthink poll, which takes surveys of large number of individuals, and asks them to rank the basketball teams.
Coaches Poll	http://sportspolls.usatoday.com/ncaa/basketball-men/polls/coaches-poll/	The Coach's Poll asks NCAA basketball coaches to rank the teams and assigns a right based off of the collective results.
Basketball Reference	http://www.basketball-reference.com/about/factors.html	Basketball reference.com is an excellent resource for quickly learning the basics of basketball statistics.
Basketball on Paper	https://www.amazon.com/Basketball-Paper-Rules-Performance-Analysis/dp/1574886886	*Basketball on Paper* is one of the leading books written on basketball statistics. It identifies Four Factors, which are the most important factors in assessing a team's ability.

Bibliography

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., . . . Reynolds, T. (2003). Differentiating Instruction in Response to Student Readiness, Interest, and Learning Profile in Academically Diverse Classrooms: A Review of Literature. *Journal for the Education of the Gifted, 27*(2-3), 119-145. doi:10.1177/016235320302700203

TEACHER NAME		Lesson #
James Shafto		1
MODEL	**CONTENT AREA**	**GRADE LEVEL**
Taba Concept Development	**Math**	**7**

CONCEPTUAL LENS	LESSON TOPIC
Prediction	**Introducing Basketball statistics & Analytics**

LEARNING OBJECTIVES (from State/Local Curriculum)

CCSS.MATH.CONTENT.HSS.MD.B.5
(+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
CCSS.MATH.CONTENT.HSS.MD.B.6
(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
CCSS.MATH.CONTENT.HSS.MD.B.7
(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

THE ESSENTIAL UNDERSTANDING (What is the overarching idea students will understand as a result of this lesson?	THE ESSENTIAL QUESTION (What question will be asked to lead students to "uncover" the Essential Understanding)
History informs prediction.	**How does History Inform Prediction?**

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
- Students will learn that Coach Dean Smith of UNC is arguably the father of modern basketball statistics. - Students will learn that sometimes the outcome of a game is due to luck. - Students will identify key components of winning a game. - Students will understand the importance of per-possession statistics. - The definition of statistics is : analyzing historical data in large quantities, especially for the purpose of making informed predictions and decisions.	• Students will categorize statistics vocabulary • Students will predict winners of basketball games using historical data. • Students will analyze the importance of per-possession statistics. • Students will use statistical calculations to create predictions. • Students articulate the importance of per-possession statistics to peers.

GUIDING QUESTIONS
What questions will be asked to support instruction?
Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
- **What are statistics?** - **How does the past affect the future?** - **How can we use the past to predict the future?** - **What are the most important skills to win a basketball game?** - **What is the definition of statistics?** - **Why do we care about upsets?**	- **How does your grouping help you predict future events?** - **Why did you group the items in the way you did?** - **How could you regroup your items into different categories?** - **What items might belong in multiple categories?** - **What historical data can be used to help predict upsets?**	- **How can you use the article to predict what we will do next?** - **What predictions can you make about your peers and me from our comments during the lesson?** - **How did your regrouping of ideas lead you to different predictions of the future? Why might this be so?** - **What is the relationship between statistics and prediction?**

DIFFERENTIATION (Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.			
Content	**Process**	**Product**	**Learning Environment**
The readings used in the lesson are from the NY times and use advanced vocabulary and sentence structure.	**Students engage in in-depth critical thinking as they analyze basketball statistics by grouping and regrouping ideas. Students are asked to expand their thinking**		

PLANNED LEARNING EXPERIENCES
(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

VTS procedure should be posted on the board.

- What's going on in this video?
- What do you see that makes you say that?
- What more can we find.

Students are asked to

- Look carefully at the video
- Talk about what they observe
- Back up their ideas with evidence
- Listen to and consider the views of others
- Discuss multiple possible interpretations

The teacher should be

- Paraphrase comments neutrally
- Point at the area being discussed
- Linking and framing student comments

1. All students watch the ACC recap of the 2014 UNC upsetting #5 Duke. https://www.youtube.com/watch?v=YfrfguEE3iA (10 min)
2. After allowing students to watch the reel 3 times through on repeat, turn off the sound and begin VTS questioning.
3. Provide students with paper to write down what they notice.
4. Allow students to drive the discussion – 15 minutes.

After Some discussion, begin asking questions of the students to direct them towards talking about prediction and what goes into predicting a game.

5. Why do we care about upsets? What factors go into creating an upset? How can an upset be predicted? (10 min)

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

Listing (15 minutes)

1. Students will read a NY Times article entitled "Dean Smith was Pioneer in use of Analytics." The article emphasizes Dean Smith's use of points per possession in his game recap with his teams. The teacher should direct students to read the article and highlight words, which have to do with prediction or making predictions.

Articles
http://www.nytimes.com/2015/02/10/sports/smiths-innovations-included-an-early-zeal-for-statistical-analysis.html

2. After students have made their lists, they will share them with the class and the teacher will make a comprehensive list on the board.
3. Teacher gives instructions on the next section, "Grouping and labeling" according to the concept "prediction."

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

Grouping And Labeling (7 minutes)

1. In assigned groups of 3-4, students will sub-categorize the comprehensive list into self-selected groupings having to do with prediction. The teacher will oversee the groups to encourage collaboration between working parties. When students are stuck, the teacher should guide with questions only. Students must follow the following rules (15 minutes)

a. There must be at least 4 categories and no more than 6 categories.
b. Students must use at least 30 total items.
c. There can be no fewer than 4 items in any group.
d. Items can only be placed in one group.

2. After students are done grouping, the teacher asks them to label their groups. (5 min)
3. After labeling, students will share how they grouped each section and why. After students share, the teacher should guide them to connect back to the essential question: "How can looking at historical data help us create predictions?"
    a. What generalizations can you make about prediction or making predictions as a result of grouping and labeling?
    b. Flesh these ideas out completely.

Elaborate —Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways.

Subsuming, Regrouping, Renaming (10 minutes)

1. The teacher will instruct students to reread the article now with emphasis on the concept "History." : Run the TABA a second time. (15 minutes)
    a. The groups must be new categories.
    b. Items can be reused.
    c. The same rules apply as above.
    d. Categories are now linked to "History."
2. After labeling, students will share how they grouped each section and why. After students share, the teacher should guide them to connect back to the essential question: "How does history inform prediction?

Evaluate: This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies. (10 minutes)

1. The teacher will wrap up the lesson by asking the class to explain the relationship between historical data and prediction.
2. Students will write at least one paragraph explaining the relationship between statistics and prediction. They will then share out what they wrote in conclusion.

Break - 5 minutes

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

1. Give students the performance task and have them read it quietly to themselves and write down 2 questions they have. (5 minutes)
2. Respond to questions about the performance task.

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

Give students copies of historical data form the 2002 NCAA tournament. Data will be taken from Ken Pom and from "Databasesports" (Only those teams that made it into the elite 8.) Students will also be given the actual bracket with seeding included on the bracket.
http://www.databasesports.com/ncaab/tourney.htm?yr=2008
http://kenpom.com/index.php?y=2002

Step 1. VTS of just the bracket – Do this for about 2 minutes.
Step 2: VTS Also give students the Databasesports data and rankings – Have students make predictions.
Step 3: Give Students Ken Pom Data. – Have students adjust their predictions.
VTS procedure should be posted on the board.

- What's going on with this data?
- What do you see that makes you say that?

- What more can we find.

Students are asked to

- Look carefully at the video
- Talk about what they observe
- Back up their ideas with evidence
- Listen to and consider the views of others
- Discuss multiple possible interpretations

The teacher should be

- Paraphrase comments neutrally
- Point at the area being discussed
- Linking and framing student comments

Students should be trying to connect the dots on the data. Have them focus on only 2 teams. Then predict who will win.

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

After Some discussion, begin asking questions of the students to direct them towards talking about prediction and what goes into predicting a game.

What statistics can be used to predict a game? – What statistical elements might have helped to predict upsets

Elaborate —Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways.

After VTS, give students around 10 minutes to prepare a 1-minute presentation about why they made their predictions like they did. Explain that they will now be the wealthy patrons. Each student gets $100 to invest in someone's bracket. Each bracket is then compared with the final bracket. Use fantasy bracket rules to get points. The first second and third place winners get 60%, 30%, 10% respectively.

Students bet on who they think will take the pot, then we run a simulation of the actual numbers with real scores. From the actual games.

After Scores are calculated, the teacher awards students shares of the pot based off the bets given.

Reflecting on that actually happened with the statistics.
How can you modify your historical analysis to more accurately predict winners of basketball games?

Evaluate: This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies. (10 minutes)

Students are given about 30 minutes to begin brainstorming ways of presenting their handbook.
The teacher hands out the rubric of the handbook and students work on it the rest of class.

1. The teacher will wrap up the lesson by asking the class to explain the relationship between historical data and prediction.

Bibliography

Credit given to Ms. Frizzle for the formatting and wording duplicated in the above lesson plan.

NCAA Bracketology Day 1

•••

History informs prediction

VTS - Visual Thinking Strategies Procedure

1. Look carefully at the data
2. Make comments on what you observe
3. Back up your ideas with evidence
4. Listen to and consider the views of others
5. Discuss multiple possible interpretations.


ACC
DIGITAL NETWORK
ESPN
ACC NETWORK
5 DUKE
62
BONUS
UNC
64
BONUS +
2ND 1:30
09


ACC
DIGITAL NETWORK
VS
HIGHLIGHTS

Close Reading Technique - Prediction

Article :

Underline key words and phrases centered around the topic “Prediction”

- If you don’t know a vocabulary word underline it anyway.

Hand out “Close reading technique”.

Groupings

Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7
Kentucky	UCLA	Duke	Connecticut	Arizona	Ohio State	Arkansas
Kansas	UNC (Tar Heels)	Louisville	Indiana	Cincinnati	Utah	Texas

TABA Procedures Concept = Prediction

a. You must have at least 4 categories and no more than 6 categories.

b. You must use at least 25 total items (vocabulary).

c. There can be no fewer than 4 items in any group.

D. Items can only be placed in one group.

Grouping Concept = Prediction

Get together in the following groups and talk about your grouping and labeling. Remember to center your conversation around the concept : Prediction.

Group 1	**Group 2**	**Group 3**	**Group 4**
Group 8	Group 7	Group 6	Group 5

TABA Procedures

Concept = Prediction

1. Label your groups.
2. Share how you grouped each section & why.
3. Using these groupings, “How does History inform Prediction?”
4. What generalizations can you make about prediction as a result of grouping and labeling?

TABA Procedures Concept = Prediction

a. You must have at least 4 categories and no more than 6 categories.

b. You must use at least 30 total items (vocabulary).

c. There can be no fewer than 4 items in any group.

D. Items can only be placed in one group.

TABA Procedures Concept = Prediction

a. You must have at least 4 categories and no more than 6 categories.

b. You must use at least 30 total items (vocabulary).

c. There can be no fewer than 4 items in any group.

D. Items can only be placed in one group.

TABA Procedures Concept = History

1. Label your groups. - you may not use the same labels.
2. Share how you grouped each section & why.
3. Using these groupings, “How does History inform Prediction?”
4. What generalizations can you make about prediction as a result of grouping and labeling?

Grouping Concept = History

Get together in the following groups and talk about your grouping and labeling. Remember to center your conversation around the concept : Prediction.

Groupings

Group 1	**Group 2**	**Group 3**	**Group 4**
Group 8	Group 7	Group 6	Group 5

Reflect - How does history inform prediction?

What is the relationship between historical data and prediction?

How does history inform prediction?

Break - 10 minutes

Performance Task - 5 minutes.

- Read the performance task quietly to yourself.
- Write down 2 questions you have about it at the bottom of the page.

Simulation - Bracketology

1. Bracket with seedings
2. Database Sports Rankings
3. Ken Pom Data

Ken Pom and Database Sports Handouts

VTS - Visual Thinking Strategies Procedure

1. Look carefully at the data
2. Make comments on what you observe
3. Back up your ideas with evidence
4. Listen to and consider the views of others
5. Discuss multiple possible interpretations.

Simulation Rules

- You will each receive $1million every day to bid where you deem fit.
- Every day you must spend 50% of your total money.
- The winner of the bracket challenge will receive 25% of the money bet on the pot.
- The rest of the money is divided up proportionally and distributed to the wealthy clients who bet on him or her.
- The Client with the most money at the end of the game wins.

Predictions - Groups of 2 - 15 minutes

1. Fill out your bracket with your partner.
2. Prepare a 1 minute presentation explaining to the wealthy clients of the room why we should bid on your bracket.

Biding

1. Bet money on who you think has the best bracket.
2. Run the simulation.
3. Who actually won.
4. Tally up the scores
5. The game maker Divides up the money according to the game rules.

Work on your handbook - Rest of class.

Groups of 2.

Decide on a format by the end of the day.

Begin developing strategies for what you will include in the handbook.

http://kenpom.com/stats.php

KenPom's History Helps Predict the 2016 National Champion

Reags

We've finally hit the point where KenPom may have jumped the shark. Everyone loves talking about advanced statistics (myself included) and it's something the committee takes into consideration for seeding.

So if you're not into advanced stats or not familiar with KenPom, this may sound like a lot of random stuff strung together – even if you're into KenPom, it still might but bear with me here. I went and looked at the pre-tournament stats for each champion since KenPom came into existence in 2002.

From there I ran the numbers, looking for any sort of trend of champions before the tourney started – earlier this year I gave numbers for post-tourney, which showed the eventual champion will finish in the top-40 in Adjusted Defense (AdjD) and Adjusted Offense (AdjO.)

Right away you could throw out Adjusted Tempo (AdjTempo) as that means nothing to determining who can win the national title. The fastest playing team was North Carolina in 2005, who ranked 5th in the country while the slowest playing team was UConn in 2014, ranking 247th.

Year	TeamName	Tempo	RankAdjTempo	AdjOE	RankAdjOE	RankAdjDE	Pythag	RankPythag
2002	Maryland	75.2758	12	116.2551	4	14	0.939818	4
2003	Syracuse	72.1235	51	112.2866	16	38	0.882229	20
2004	Connecticut	70.0699	73	113.6357	14	8	0.934551	5
2005	North Carolina	76.725	5	119.3614	3	9	0.957522	2
2006	Florida	69.217	97	113.8817	14	18	0.91981	7
2007	Florida	67.1577	178	118.3834	3	18	0.943394	5
2008	Kansas	68.7223	98	120.8601	1	6	0.968236	1
2009	North Carolina	75.7745	7	121.9082	1	49	0.944018	4
2010	Duke	67.6228	198	116.9563	6	6	0.957498	2
2011	Connecticut	66.2195	193	113.8185	17	30	0.902118	13
2012	Kentucky	66.1184	191	118.6576	2	5	0.963407	1
2013	Louisville	66.668	112	112.1925	18	1	0.966287	1
2014	Connecticut	65.9229	247	109.4778	80	11	0.86882	25
2015	Duke	66.5735	103	122.0297	3	57	0.939527	7

What did jump out right away was every champion was ranked in the KenPom Top-25 before the NCAA Tournament started. 2014 UConn was no surprise the lowest ranked team right at No. 25 while three No. 1 teams (2008 Kansas, 2012 Kentucky and 2013 Louisville) won.

Below is a table of what the eventual national champions looked like ranking wise before the NCAA Tournament started:
Ruling out teams outside the KenPom top-25, don't put any money on UConn, Notre Dame, Wisconsin, Texas or Gonzaga. Looking at the raw numbers, each team in the top-25 must be top-80 AdjO and top-60 AdjD, pretty high numbers, but still in the top 23 percent of the country. So other teams you can rule out include Indiana (64 AdjD), Iowa State (No. 11 AdjD), Duke (No. 111 AdjD) and Baylor (No. 90 AdjD). Clearly that tired old saying of defense wins championships is true in KenPom's world.

So, that leaves the following teams as eligible to win the national title: Virginia, Kansas, Michigan State, Villanova, UNC, West Virginia, Kentucky, Oklahoma, Wichita State, Miami, Xavier, Arizona, Purdue, Oregon, Iowa, Cal, Texas A&M, Utah and Maryland. That's 19 possible teams, which seems right for how this season is going.

What if you take the averages of the national championship winners since 2002? Well, the field gets a lot smaller. If you take the average Pythagorean (Pythag) number, AdjO and AdjD – 3 of the main components to KenPom's stats, only three teams can win it. The average numbers are .934803 Pythag, Top-13 AdjO and Top-19 AdjD.

Those three teams might surprise you as they are Kansas, Virginia and Villanova. Michigan State just misses based on AdjD as does UNC while Oklahoma and WVU barely miss on AdjO. So if you buy into KenPom and the law of large numbers, put your money on Kansas, Virginia and Villanova.

	AP Poll					Coaches Pol								
LETTER	Rank	Prev	Team	Conference	LETTER	Rank	Prev	Team	Wins	Losses	Votes	1st Place	Conference	
A	1	1	Illinois	Big Ten	B	1	3	North Carolina	33	4	775	31	ACC	
B	2	2	North Carolina	ACC	A	2	1	Illinois	37	2	744	0	Big Ten	
C	3	5	Duke	ACC	D	3	4	Louisville	33	5	704	0	Big East	
D	4	6	Louisville	Big East	O	4	15	Michigan State	26	7	676	0	Big Ten	
E	5	3	Wake Forest	ACC	G	5	5	Kentucky	28	6	637	0	SEC	
F	6	10	Oklahoma State	Big 12	I	6	9	Arizona	30	7	612	0	Pac 10	
G	7	4	Kentucky	SEC	C	7	2	Duke	27	6	560	0	ACC	
H	8	14	Washington	Pac 10	F	8	8	Oklahoma State	26	7	515	0	Big 12	
I	9	8	Arizona	Pac 10	H	9	7	Washington	29	6	511	0	Pac 10	
J	10	11	Gonzaga	West Coast	T	10	19	Wisconsin	25	9	489	0	Big Ten	
K	11	16	Syracuse	Big East	E	11	6	Wake Forest	27	6	399	0	ACC	
L	12	9	Kansas	Big 12		12	32	West Virginia	24	11	364	0	Big East	
M	13	12	Connecticut	Big East	S	13	22	Villanova	24	8	355	0	Big East	
N	14	7	Boston College	ACC	R	14	17	Utah	29	6	333	0	Mountain West	
O	15	13	Michigan State	Big Ten	L	15	10	Kansas	23	7	253	0	Big 12	
P	16	-	Florida	SEC	X	16	24	Texas Tech	22	11	251	0	Big 12	
Q	17	17	Oklahoma	Big 12	M	17	14	Connecticut	23	8	249	0	Big East	
R	18	15	Utah	Mountain West	J	18	11	Gonzaga	26	5	239	0	West Coast	
S	19	19	Villanova	Big East	N	19	12	Boston College	25	5	234	0	ACC	
T	20	23	Wisconsin	Big Ten	Q	20	16	Oklahoma	25	8	218	0	Big 12	
U	21	20	Alabama	SEC	K	21	13	Syracuse	27	7	179	0	Big East	
V	22	18	Pacific	Big West		22	38	NC State	21	14	137	0	ACC	
W	23	21	Cincinnati	Big East		23	30	Milwaukee	26	6	123	0	Horizon	
X	24	-	Texas Tech	Big 12	P	24	18	Florida	24	8	118	0	SEC	
Y	25	-	Georgia Tech	ACC	W	25	23	Cincinnati	25	8	96	0	Big East	
					V	26	20	Pacific	27	4	84	0	Big West	
					Y	27	25	Georgia Tech	20	12	45	0	ACC	
					U	28	21	Alabama	24	8	45	0	SEC	
						29	43	Vermont	25	7	34	0	America East	
						30	-	South Carolina	20	13	12	0	SEC	
						31	32	Texas	20	11	11	0	Big 12	
						32	35	Southern Illinois	27	8	10	0	Missouri Valley	
						33	35	Minnesota	21	11	10	0	Big Ten	
						34	38	Iowa	21	12	10	0	Big Ten	
						35	-	St. Joseph's (PA)	24	12	9	0	A-10	

	Letter	Seed	Team	Conf	Adjusted Tempo		Adjusted Offensive Efficiency		effective Field Goal%		Turn Overs %		Offensive Rebound %		Free Throw Rate		Ajusted Defense		Effective Field Goal %		Turn Over %		Offensive Rebound %		Free Throw Rate	
2005	B	1	North	AC	73.9	8	121.9	2	56	4	21	149	39.7	18	44.2	20	91.7	12	46.4	36	23.1	56	31.5	64	30.3	49
	I	3	Arizo	P10	69.3	83	115.7	10	53.4	28	20.7	125	40	15	30.9	290	94.8	39	49.2	162	22.5	89	34.8	205	28.2	24
	A	1	Illinoi	B10	65.1	251	120.9	3	56	5	16.6	2	34.7	134	28.8	314	89.8	4	47.1	63	22.3	96	31.2	51	30.4	50
	T	6	Wisco	B10	63.6	297	110.3	35	51	89	17.9	22	31	255	38.3	117	91.7	11	47.3	67	18.4	305	25.9	2	27.9	20
	D	4	Louisv	CU	68	122	117.5	7	55.1	12	19.9	86	37.2	47	43.3	29	94.7	37	44.8	12	23	60	31.3	53	37	164
	Z	7	West	BE	64.3	279	113.9	11	53.2	31	17.6	15	30.2	275	31.1	285	99.1	102	50.9	234	22.9	68	35.9	251	31.9	77
	O	5	Michi	B10	67.6	142	118.6	6	54.6	18	19.9	91	38.9	27	37.3	144	94.6	32	48.8	136	22.1	108	29.6	23	37.9	187
	G	2	Kentu	SE	67.3	162	111.5	28	52.1	52	18.8	42	35.4	101	37.6	137	90.4	6	46.6	47	25.5	13	34.2	179	31.8	75

	AP Poll			Coaches Pol							
LETTER	Rank	Prev	LETTER	Rank	Prev	Wins	Losses	Votes	1st Place		
A	1	1	B	1	3	33	4	775	31		
B	2	2	A	2	1	37	2	744	0		
C	3	5	D	3	4	33	5	704	0		
D	4	6	O	4	15	26	7	676	0		
E	5	3	G	5	5	28	6	637	0		
F	6	10	I	6	9	30	7	612	0		
G	7	4	C	7	2	27	6	560	0		
H	8	14	F	8	8	26	7	515	0		
I	9	8	H	9	7	29	6	511	0		
J	10	11	T	10	19	25	9	489	0		
K	11	16	E	11	6	27	6	399	0		
L	12	9		12	32	24	11	364	0		
M	13	12	S	13	22	24	8	355	0		
N	14	7	R	14	17	29	6	333	0		
O	15	13	L	15	10	23	7	253	0		
P	16	-	X	16	24	22	11	251	0		
Q	17	17	M	17	14	23	8	249	0		
R	18	15	J	18	11	26	5	239	0		
S	19	19	N	19	12	25	5	234	0		
T	20	23	Q	20	16	25	8	218	0		
U	21	20	K	21	13	27	7	179	0		
V	22	18		22	38	21	14	137	0		
W	23	21		23	30	26	6	123	0		
X	24	-	P	24	18	24	8	118	0		
Y	25	-	W	25	23	25	8	96	0		
			V	26	20	27	4	84	0		
			Y	27	25	20	12	45	0		
			U	28	21	24	8	45	0		
				29	43	25	7	34	0		
				30	-	20	13	12	0		
				31	32	20	11	11	0		
				32	35	27	8	10	0		
				33	35	21	11	10	0		
				34	38	21	12	10	0		
				35	-	24	12	9	0		

Letter	Seed			Adjusted Tempo		Adjusted Offensive Efficiency		effective Field Goal%		Turn Overs %		Offensive Rebound %		Free Throw Rate		Ajusted Defense		Effective Field Goal %		Turn Over %		Offensive Rebound %		Free Throw Rate	
B	1			73.9	8	121.9	2	56	4	21	149	39.7	18	44.2	20	91.7	12	46.4	36	23.1	56	31.5	64	30.3	49
I	3			69.3	83	115.7	10	53.4	28	20.7	125	40	15	30.9	290	94.8	39	49.2	162	22.5	89	34.8	205	28.2	24
A	1			65.1	251	120.9	3	56	5	16.6	2	34.7	134	28.8	314	89.8	4	47.1	63	22.3	96	31.2	51	30.4	50
T	6			63.6	297	110.3	35	51	89	17.9	22	31	255	38.3	117	91.7	11	47.3	67	18.4	305	25.9	2	27.9	20
D	4			68	122	117.5	7	55.1	12	19.9	86	37.2	47	43.3	29	94.7	37	44.8	12	23	60	31.3	53	37	164
ZA	7			64.3	279	113.9	11	53.2	31	17.6	15	30.2	275	31.1	285	99.1	102	50.9	234	22.9	68	35.9	251	31.9	77
O	5			67.6	142	118.6	6	54.6	18	19.9	91	38.9	27	37.3	144	94.6	32	48.8	136	22.1	108	29.6	23	37.9	187
G	2			67.3	162	111.5	28	52.1	52	18.8	42	35.4	101	37.6	137	90.4	6	46.6	47	25.5	13	34.2	179	31.8	75

TEACHER NAME		Lesson #
James Shafto		2
MODEL	**CONTENT AREA**	**GRADE LEVEL**
Socratic Seminar	**Statistics**	**6-8th Grade**

CONCEPTUAL LENS	LESSON TOPIC
Prediction	**Probability Models for Basketball Analytics**

LEARNING OBJECTIVES (from State/Local Curriculum)

CCSS.MATH.CONTENT.HSS.MD.B.5
(+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
CCSS.MATH.CONTENT.HSS.MD.B.6
(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
CCSS.MATH.CONTENT.HSS.MD.B.7
(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

THE ESSENTIAL UNDERSTANDING (What is the overarching idea students will understand as a result of this lesson?	THE ESSENTIAL QUESTION (What question will be asked to lead students to "uncover" the Essential Understanding)
History Informs Prediction	**How does history inform prediction?**

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)

- **Kenpom is one of the most important basketball analytics tools.**
- **The history of Kenpom prediction can help us accurately predict basketball national champions.**
- **Patterns in historical data are key to creating models for prediction.**
- **AdjD is adjusted Defense**
- **Dean Oliver's 4 factors of basketball are**
  o **Shooting**
  o **Turnovers**
  o **Rebounding**
  o **Free throws**
- **A team's history in the four factors informs prediction of who will win games.**
	Students will be able to:
	- **Research and analyze historical data to determine patterns for prediction**
	- **Analyze an article and find patters patterns in historical data.**
	- **Collaborate with peers to brainstorm the most important patterns to track and use in basketball analytics.**
	- **Collect organize and analyze data.**
	- **Evaluate and decide on how data should be weighted to inform prediction.**
	- **Craft questions and maintain an inquiry-based dialogue, which examines ideas and concepts.**

GUIDING QUESTIONS
What questions will be asked to support instruction?
Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding

Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
- What do you think are the most important skills a team needs to win a basketball game? - What individual skills are needed to win a basketball game? - How do you feel while watching the video? - What are your thoughts while watching the video? - What is necessary to win a basketball game? - What are strategies we can use to predict upsets?	- How do adjusted offense and defense interact to result in wins or losses in a gam? - How do the four factors interact to result in wins or losses in a game? - How can we use the four factors to predict the winners and losers of a game? - What is necessary to win a basketball game? - How does historical data inform prediction? - How can teams use history to	- What patterns did the author identify? - What theme or big idea did you discover through participating in this seminar? - What generalizations could you make about the impact of analytics on prediction? - How did this seminar help deepen your knowledge of basketball statistics? - How does history inform prediction? - How does analytics change the

	adjust their play to win basketball games? - How can Individuals use history to adjust their games to "beat the odds?" - How can coaches use history to adjust their games to win?	way you watch basketball games? - How did your roll in the seminar (inner/outer) impact your feelings about prediction? - How will you structure your brackets differently as a result of your participation in the seminar?

DIFFERENTIATION

(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.

Content	Process	Product	Learning Environment
Content for this learning experience represents above grade level material for the group of students and is more complex in nature.	**Students will participate in Socratic Seminar. Students will facilitate the seminar themselves and will be responsible for crafting questions that maintain the integrity of the seminar.** **Students will participate in a simulation and have choice in how they select teams and**	**Students will participate in a simulation in which they will be able to set their own value ratings on the Dean Oliver's 4 factors of basketball.**	**Students will work in a variety of environments in this learning experience; independently, small group, and seminar.**

PLANNED LEARNING EXPERIENCES
(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students.

Before students enter the classroom, the teacher will provide each student with an index card. On each index card is written the following prompt: "How do you feel while watching the video? What are your thoughts while you are watching the videos? Write about the impact watching the videos has on you."

As students enter the room, the lights will be out and the last 2 minutes of Lehigh beating duke looping on the board.
https://www.youtube.com/watch?v=DO5Saq4QOZM

Once all students have viewed the videos, allow students to share orally what they wrote on their index cards.
Once every student has the opportunity to share their personal reactions, pose the following questions to the students. Students will respond orally to the questions. The questions will be on chart paper and scribes will be responsible for recording student responses. The whole class will participate in the discussion surrounding the questions:

1. What happened in the video you watched?
2. How might the events have impacted other viewers? Why?
3. How might the events have turned out differently?
4. If the teams had played each other before, how might they have reacted differently?
5. How might these events have been predicted before the game began?
6. How does history inform prediction?

Explore - In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.

Students will each be provided with a copy of "Reviewing the four Factors" four here :
http://www.streakingthelawn.com/2015/11/9/9694148/tempo-free-stats-explaining-the-four-factors-uva-basketball

The teacher will read the first paragraph of the article out loud as the students listen quietly. The teacher will then demonstrate close reading technique which the students should use as they finish reading the article. They should record questions and comments in the margins as they read. The close reading strategy should be posted on the board as the students read. Once all students have read and annotated,

Run Socratic Seminar with inner and Outer Circle. (15 minutes)

Students will be divided into groups of four. Each group will be expected to have read the article. Each group will then be assigned a second article on basketball statistics from the lists below.

1. Robo Scout and the four Factors of Basketball Success. http://www.rawbw.com/~deano/articles/20040601_roboscout.htm

2. Explanations of the Stats http://www.tarheelhoopla.com/?page_id=57
3. What wins basketball games http://www.sfandllaw.com/Articles/What-Wins-Basketball-Games-a-Review-of-Basketball-on-Paper-Rules-and-Tools-for-Performance-Analysis.shtml
4. An Introduction to Advanced Basketball Statistics: Understanding Possession Estimation and the Factors that Control Efficiency
http://www.burntorangenation.com/2011/10/19/2464697/advanced-basketball-statistics-understanding-possession-estimation

Students will be instructed to read their articles silently and independently. Each students should employ the "close reading" strategy to accomplish the initial reading. When all group members have read their chapter, the group should discuss notes and questions they have written during the close reading. Each group should craft five questions as a result of the close reading. Questions should represent higher levels of thinking. The teacher should demonstrate Higher order thinking questions. Provide students with a copy of Blooms question wheel as needed. (Students will reference these questions during the Socratic Seminar)

Explain - Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.

When groups have completed their task, students come back together and the teacher asks the following questions:

1. What is necessary to win a basketball game?
2. How does historical data inform prediction?
3. How can teams use history to adjust their play to win basketball games?
4. How can Individuals use history to adjust their games to "beat the odds?"
5. How can coaches use history to adjust their games to win?

Students respond to the questions orally. Multiple responses representing personal viewpoints as well as the viewpoints of the articles should be encouraged.

Elaborate —Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways

The teacher will lead the students in a discussion of Socratic Seminar expectations and will hand out "Academic Language Scripts" for students to use while discussing. The expectations will be posted on the board throughout the seminar.

Students are divided into two groups. One group will compose the inner circle of the Socratic Seminar, one group will form the outer circle of the Socratic Seminar. The inner circle members begin the dialogue while the outer circle members take notes about the dialogue, craft questions about the dialogue and observe one participant of the inner circle (their partner for the seminar. They should take notes on their partner using the "Socratic Seminar Fishbowl" handout). The leader, one student designated by the teacher, will begin the seminar with one provocative question. Inner circle students will follow expectations for academic dialogue and respond in turn.

Opening Questions might include: (If the leader does not have an opening question, these could be used. These questions could also be inserted if the dialogue during the seminar falters.)

- Is offense or defense the most important factor for winning a basketball game?
- If you had the opportunity to bet money on a game, how would you go about predicting which team to pick?

Students will dialogue for 10 minutes, then the inner and outer circles will change places. The new outer circle members will take the place of their partners and will be taking notes, crafting questions and observing their inner circle counterpart.

When the students have completed the seminar (after 10 minutes with the second circle), the teacher poses the following questions. (Repeated from throughout the lesson) Encourage students to explain why they did or did not change their responses.

1. What happened in the video you watched?
2. How might the events have impacted other viewers? Why?
3. How might the events have turned out differently?
4. If the teams had played each other before, how might they have reacted differently?
5. How might these events have been predicted before the game began?
6. How does history inform prediction?

After students have shared their responses orally, they are instructed to return to their small groups.

Evaluate: This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.

After students have shared their responses, the video will be played again. The teacher will point out that basketball games are not won simply in the last 3 minutes. In their groups students will be given the data from the final 4 matchups of the 2007 NCAA tournament. They will be asked to predict winners based off what they've just discussed.

Task: Make a prediction about this game. Who will win? How did you use history to make your prediction?

Bibliography:

Credit given to Sally Sue Cratis for the structure and formatting of the lesson.

NCAA Bracketology Day 2

•••

History informs prediction
The Four Factors of Basketball

Simulation Rules

- You will each receive $1million every day to bid where you deem fit.
- Every day you must spend 50% of your total money.
- The winner of the bracket challenge will receive 25% of the money bet on the pot.
- The rest of the money is divided up proportionally and distributed to the wealthy clients who bet on him or her.
- The Client with the most money at the end of the game wins.

Predictions - Groups of 2 - 15 minutes

1. Fill out your bracket with your partner.
2. Prepare a 1 minute presentation explaining to the wealthy clients of the room why we should bid on your bracket.

Biding

1. Bet money on who you think has the best bracket.
2. Run the simulation.
3. Who actually won.
4. Tally up the scores
5. The game maker Divides up the money according to the game rules.

https://www.youtube.com/watch?v=DO5Saq4QOZM

Take notes on what you observe in the video -

Groupings

Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**	**Group 6**	**Group 7**
Vann	Eli	TJ	Samuel	Thomas**	Asha	Cole
Max	Carson	Lucas	Valerio	Caleb	Jack	Levi

Questioning

Share with your partners what you observed in the video. Center your conversation around the question “How does History inform prediction?”

1. What happened in the video you watched?
2. How might the events have impacted other viewers? Why?
3. If the teams had played each other before, how might the game have ended differently?
4. How might these events have been predicted before the game began?
5. How does history inform prediction?

Mini - Lesson —> Math of the Four Factors

The math behind the Four Factors

Socratic Seminar - Close Reading Technique

Article : Reviewing the 4 factors

- Craft 3 questions about the reading to bring to the larger group. Aligne questions with the concept of Prediction.

“Close reading technique”.

Socratic Seminar Instructions.

Hand out “Socratic Seminar Fishbowl”

Hand out “Academic Language Scripts”

Instructions -

Inner Circle - The inner circle discusses the article with each other using professional discourse. The goal is to develop concepts and ideas, not debate topics.

Outer Circle - The outer circle listens and takes notes on what the inner circle is saying.

After a time, the outer and inner circle swap.

Academic Language

- Speak respectfully
- Take turns
- Use other elaborate on other people's ideas
- Connect the article to your own experience
- Remember the concept "History informs prediction."
- Remember: This is not a debate.

Socratic Seminar - Close Reading Technique

Article - NBA Advanced Statistics

Close reading technique

Further Reading

https://harvardsportsanalysis.wordpress.com/2011/02/21/re-examining-the-four-factors-the-case-for-free-throws-made-per-100-possessions/

http://www.rawbw.com/~deano/articles/20040601_roboscout.htm

Socratic Seminar - In groups

1. Read each article, then discuss the article in your group using the Socratic Seminar method. (10 minutes)
2. Each group should craft 5 questions to bring to the larger group. Align questions with the conept of prediction.
3. Transition to whole group and discuss around the question “How does history inform prediction,” in the larger group.

Socratic Seminar Instructions.

Student observations Sheet : Socratic Seminar

Instructions -

Inner Circle - The inner circle discusses the article with each other using professional discourse. The goal is to develop concepts and ideas, not debate topics.

Outer Circle - The outer circle listens and takes notes on what the inner circle is saying.

After a time, the outer and inner circle swap.

Rules for Professional Discourse

- Speak respectfully
- Take turns
- Use other elaborate on other people's ideas
- Connect the article to your own experience
- Remember the concept "History informs prediction."
- Remember: This is not a debate.

Work on your handbook - 45 minutes

Groups of 2.

Begin discussing what types of data you will use in your handout.

Questions

Will your handbook include emotional reactions?

How do you predict upsets between close teams?

Groupings

Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**	**Group 6**	**Group 7**
Vann	Eli	TJ	Samuel	Thomas**	Asha	Cole
Max	Carson	Lucas	Valerio	Caleb	Jack	Levi

Simulation Rules

- You will each receive $1million every day to bid where you deem fit.
- Every day you must spend 50% of your total money.
- The winner of the bracket challenge will receive 25% of the money bet on the pot.
- The rest of the money is divided up proportionally and distributed to the wealthy clients who bet on him or her.
- The Client with the most money at the end of the game wins.

Predictions - Groups of 2 - 15 minutes

1. Fill out your bracket with your partner.
2. Prepare a 1 minute presentation explaining to the wealthy clients of the room why we should bid on your bracket.

Biding

1. Bet money on who you think has the best bracket.
2. Run the simulation.
3. Who actually won.
4. Tally up the scores
5. The game maker Divides up the money according to the game rules.

NBA Advanced Stats: The Four Factors Of Winning

by Mika Honkasalo 1 year ago Follow @mhonkasaloNBA

When you go to, say, Basketball-Reference.com to look up statistics. Have you ever wondered what the Four Factors are and why they are so significant?

Originally the Four Factors come from Dean Oliver's (statistician, ESPN stat guy and former front office executive for the Seattle SuperSonics and Denver Nuggets) book "Basketball on Paper." A delightful read that tries to answer into many interesting aspects of the of basketball such including; Understanding the value of coaching, whether defense wins championships and possession based analysis.
The Four Factors are actually the Eight Factors, since there are four of them for both offense and defense (Oliver's relative weighted values in parentheses).

- Effective Field Goal % (40%)
- Turnover % (25%)
- Rebounding (20%)
- Free Throws per Field Goal Attempt (15%)

Oliver chose these factors and weighted values based on the fact that the combination of excellence in these four elements has a high correlation with winning. Shooting, taking care of the ball, rebounding and getting to the foul line are all skills that are mainly independent of each other.

Understanding those skills in Oliver's words can bring "strategic advantages that can be gained with a thorough understanding of these factors." And that the Four Factors can "start allowing a strategic understanding of the game."

If you want to nerd out I suggest reading a paper written by Oliver **here**.

Let's do the math and figure out how good the Four Factors are at predicting wins.

First I built a model based on the last five seasons in the NBA and ran them through a multiple linear regression which produced this function:

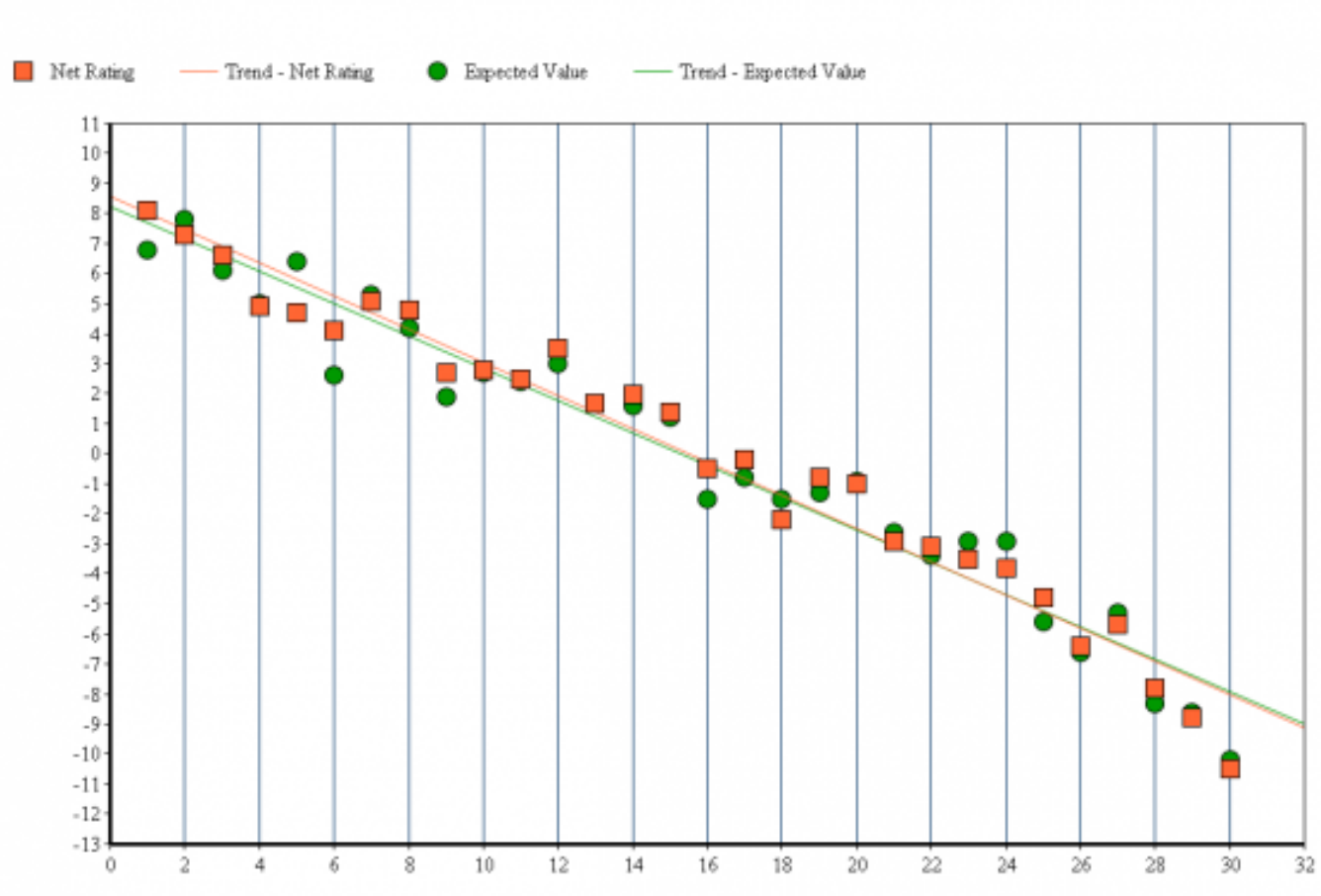
$$\mathbf{y = 144.75\,x_1 - 1.47\,x_2 + 4.28\cdot10^{-1}\,x_3 + 32.03\,x_4 - 150.85\,x_5 + 1.33\,x_6 + 4.12\cdot10^{-1}\,x_7 - 30.13\,x_8 - 37.19}$$

Where R^2 = 0.993 (Basically the function should have a very high correlation with expected results), and x1…x8 are the Four Factors. Y = Expected wins.

Then we test this model and compare the expected results to what teams actually produced based on last season's net ratings as shown below:

San Antonio Spurs Net Rating: +8.1. Expected Result: +6.8, Difference: 1.3

The final results are shown on the chart below for every team in the NBA:



The R^2 between the Four Factors and Net Rating is 96.2 percent, which means that based on this model about that much of net rating can be discovered just by knowing the Four Factors, which is an incredible insight. There's some statistical uncertainty in this but the answer is with a large likelihood between 94 and 98 percent in any case.
If you type into the equation above exactly the league averages for each category, you should get a 41-win team. This model doesn't do exactly that and produces something more equivalent to a 40.7 win squad. So it's pretty close.

Based on working with the data I would disagree a bit with Oliver's weighted values which I mentioned earlier; shooting efficiency is probably underrated and should be around or more than 50 percent. I didn't calculate the exact figures but it's definitely higher than Oliver's estimation. I'm not sure of the method he used to determine those values. The others I don't have a quarrel with.

In any case, it's really interesting that just by knowing four numbers about the game, we can predict net team's expected net ratings down to a few percentage points.

Stats are great! A better understanding of what correlates with winning and produces value can help us and give insights into what sort of strategies we should employ. Stats are often used to show how well players are doing in areas of the game we value; How many points they scored, how efficiently and how many passes did a player make.

What's just as important as measuring those things is understanding what we **ought** to value. And stats can help with that.

You can go a lot deeper into this type of analysis but just based on the regression model I used you can already start finding tangible answers to questions like: Are we better off spending our time improving defense or offense? And, are we valuing rebounding appropriately?

2004			AP Poll					Coaches Poll									
		LETTER	Rank	Prev	Team	Conference		LETTER	Rank	Prev	Team	Wins	Losses	Votes	1st Place	Conference	
		V	22	21	Arizona	Pac 10			32	25	Air Force	22	7	20	0	Mountain West	
		Y	25	-	Boston College	ACC		V	18	16	Arizona	20	10	192	0	Pac 10	
		K	11	13	Cincinnati	Big East		Y	31	34	Boston College	24	10	21	0	ACC	
		G	7	9	Connecticut	Big East			47	34	Brigham Youn	21	9	1	0	Mountain West	
		F	6	5	Duke	ACC			37	28	Charlotte	21	9	13	0	A-10	
		N	14	14	Georgia Tech	ACC		K	12	12	Cincinnati	25	7	454	0	Big East	
		C	3	3	Gonzaga	West Coast		G	7	9	Connecticut	33	6	601	0	Big East	
		M	13	12	Illinois	Big Ten			48	38	Dayton	24	9	1	0	A-10	
		P	16	18	Kansas	Big 12			27	29	DePaul	22	10	38	0	Big East	
		B	2	8	Kentucky	SEC		F	6	4	Duke	31	6	657	0	ACC	
		S	19	-	Maryland	ACC			41	34	East Tennesse	27	6	6	0	Atlantic Sun	
		X	24	23	Memphis	C-USA			30	34	Florida	20	11	24	0	SEC	
		H	8	4	Mississippi Sta	SEC		N	15	18	Georgia Tech	28	10	297	0	ACC	
		O	15	17	NC State	ACC		C	2	3	Gonzaga	28	3	682	1	West Coast	
		R	18	16	North Carolina	ACC		M	13	13	Illinois	26	7	400	0	Big Ten	
		D	4	7	Oklahoma Stat	Big 12		P	14	15	Kansas	24	9	313	0	Big 12	
		I	9	6	Pittsburgh	Big East		B	4	8	Kentucky	27	5	673	0	SEC	
		U	21	20	Providence	Big East			33	27	Louisville	20	10	20	0	Big East	
		W	23	-	South Carolina	SEC			42	43	Manhattan	25	6	5	0	MAAC	
		E	5	1	St. Joseph's (P	A-10		S	21	-	Maryland	20	12	134	0	ACC	
		A	1	2	Stanford	Pac 10		X	26	24	Memphis	22	8	62	0	C-USA	
		T	20	19	Syracuse	Big East			25	26	Michigan State	18	12	67	0	Big Ten	
		L	12	11	Texas	Big 12		H	9	5	Mississippi Sta	26	4	510	0	SEC	
		Z	25	22	Utah State	WAC		O	17	19	NC State	21	10	235	0	ACC	
		Q	17	15	Wake Forest	ACC			40	40	Nevada	25	9	6	0	WAC	
		J	10	10	Wisconsin	Big Ten		R	20	19	North Carolina	19	11	155	0	ACC	
								D	3	7	Oklahoma Stat	31	4	674	0	Big 12	
									44	40	Pacific	25	8	3	0	Big West	
								I	8	6	Pittsburgh	31	5	546	0	Big East	
								U	19	17	Providence	20	9	176	0	Big East	
									38	43	Seton Hall	21	10	8	0	Big East	
								W	45	32	South Carolina	23	11	2	0	SEC	
									23	22	Southern Illino	25	5	87	0	Missouri Valley	
								E	5	1	St. Joseph's (P	30	2	671	0	A-10	
								A	1	2	Stanford	30	2	770	28	Pac 10	
								T	24	23	Syracuse	23	8	83	0	Big East	
								L	11	11	Texas	25	8	458	0	Big 12	
									29	32	Texas Tech	23	11	26	0	Big 12	
									46	38	UAB	22	10	1	0	C-USA	
									43	-	UCF	25	6	4	0	C-USA	
									39	-	Utah	24	9	8	0	Mountain West	
								Z	22	21	Utah State	25	4	95	0	WAC	
									36	-	Vanderbilt	23	10	13	0	SEC	
								Q	16	14	Wake Forest	21	10	290	0	ACC	
									34	-	Washington	19	12	16	0	Pac 10	
									28	31	Western Michi	26	5	37	0	MAC	
								J	10	10	Wisconsin	25	7	507	0	Big Ten	
									35	-	Xavier	26	11	13	0	A-10	

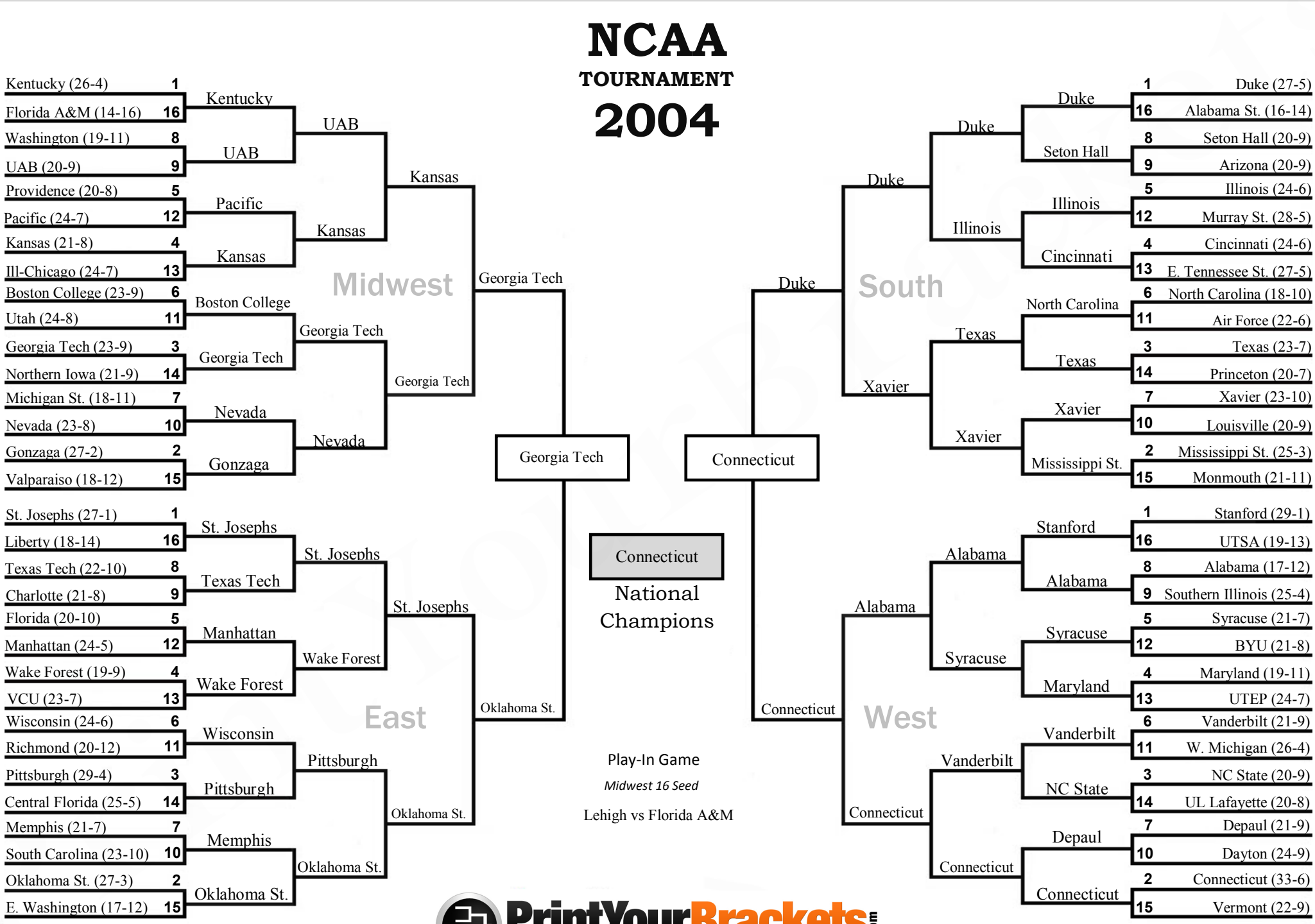
	Letter	Seed	Team	Conf	Adjusted Tempo		Adjusted Offensive Efficiency		effective Field Goal%		Turn Overs %		Offensive Rebound %		Free Throw Rate		Ajusted Defense		Effective Field Goal %		Turn Over %		Offensive Rebound %		Free Throw Rate	
2004	L	4	**Kansas 4**	**B12**	70.7	56	111.3	31	51.6	64	20.7	124	34.7	127	39.4	102	91.6	16	44.3	7	19.7	252	32.7	117	35.8	144
	Y	3	**Georgia Tech**	**ACC**	70.3	65	111.7	26	52.5	40	20.9	132	32.9	200	38.3	138	89.3	6	43.7	5	22.7	81	34.8	216	40.8	235
	C	1	**Duke 1**	**ACC**	69.8	83	118.5	3	53.2	24	19.4	57	39	15	41.2	61	89	4	44.7	13	24.3	24	36.8	282	32	55
	ZA	7	**Xavier 7**	**A10**	65.6	238	113.5	15	51	87	18.5	32	34.5	133	37.8	154	93.2	21	46.5	46	20.5	212	31.6	76	30.3	34
	E	1	**Saint Joseph'**	**A10**	68.1	151	115.5	10	56.1	5	16.9	5	29.6	290	33.7	250	90.5	10	44.4	8	24	35	36.1	258	33.4	83
	D	2	**Oklahoma St.**	**B12**	66	227	117.5	6	55.5	8	19.8	82	37.6	41	39.3	104	91	12	46.1	37	21.9	124	31.9	83	35.3	135
	ZB	8	**Alabama 8**	**SEC**	66.1	220	113.2	18	51.4	77	18.9	44	33.4	179	40.7	73	97.6	83	48.2	118	19.5	261	33	134	33.6	89
	G	2	**Connecticut 2**	**BE**	69.7	87	115.9	9	53.2	25	19.4	56	41.6	3	34.5	233	89.2	5	41.5	1	16.7	321	31.5	71	24.8	5

	AP Poll			Coaches Poll							
LETTER	Rank	Prev		LETTER	Rank	Prev		Wins	Losses	Votes	1st Place
A	1	2		A	1	2		30	2	770	28
B	2	8		C	2	3		28	3	682	1
C	3	3		D	3	7		31	4	674	0
D	4	7		B	4	8		27	5	673	0
E	5	1		E	5	1		30	2	671	0
F	6	5		F	6	4		31	6	657	0
G	7	9		G	7	9		33	6	601	0
H	8	4		I	8	6		31	5	546	0
I	9	6		H	9	5		26	4	510	0
J	10	10		J	10	10		25	7	507	0
K	11	13		L	11	11		25	8	458	0
L	12	11		K	12	12		25	7	454	0
M	13	12		M	13	13		26	7	400	0
N	14	14		P	14	15		24	9	313	0
O	15	17		N	15	18		28	10	297	0
P	16	18		Q	16	14		21	10	290	0
Q	17	15		O	17	19		21	10	235	0
R	18	16		V	18	16		20	10	192	0
S	19	-		U	19	17		20	9	176	0
T	20	19		R	20	19		19	11	155	0
U	21	20		S	21	-		20	12	134	0
V	22	21		Z	22	21		25	4	95	0
W	23	-			23	22		25	5	87	0
X	24	23		T	24	23		23	8	83	0
Y	25	-			25	26		18	12	67	0
Z	25	22		X	26	24		22	8	62	0
					27	29		22	10	38	0
					28	31		26	5	37	0
					29	32		23	11	26	0
					30	34		20	11	24	0
				Y	31	34		24	10	21	0
					32	25		22	7	20	0
					33	27		20	10	20	0
					34	-		19	12	16	0
					37	28		21	9	13	0
					36	-		23	10	13	0
					35	-		26	11	13	0
					38	43		21	10	8	0
					39	-		24	9	8	0
					41	34		27	6	6	0
					40	40		25	9	6	0
					42	43		25	6	5	0
					43	-		25	6	4	0
					44	40		25	8	3	0
				W	45	32		23	11	2	0
					47	34		21	9	1	0
					48	38		24	9	1	0
					46	38		22	10	1	0

Letter	Seed		Adjusted Tempo		Adjusted Offensive Efficiency		effective Field Goal%		Turn Overs %		Offensive Rebound %		Free Throw Rate		Ajusted Defense		Effective Field Goal %		Turn Over %		Offensive Rebound %		Free Throw Rate	
C	1		69.8	83	118.5	3	53.2	24	19.4	57	39	15	41.2	61	89	4	44.7	13	24.3	24	36.8	282	32	55
D	2		66	227	117.5	6	55.5	8	19.8	82	37.6	41	39.3	104	91	12	46.1	37	21.9	124	31.9	83	35.3	135
G	2		69.7	87	115.9	9	53.2	25	19.4	56	41.6	3	34.5	233	89.2	5	41.5	1	16.7	321	31.5	71	24.8	5
E	1		68.1	151	115.5	10	56.1	5	16.9	5	29.6	290	33.7	250	90.5	10	44.4	8	24	35	36.1	258	33.4	83
ZA	7		65.6	238	113.5	15	51	87	18.5	32	34.5	133	37.8	154	93.2	21	46.5	46	20.5	212	31.6	76	30.3	34
ZB	8		66.1	220	113.2	18	51.4	77	18.9	44	33.4	179	40.7	73	97.6	83	48.2	118	19.5	261	33	134	33.6	89
Y	3		70.3	65	111.7	26	52.5	40	20.9	132	32.9	200	38.3	138	89.3	6	43.7	5	22.7	81	34.8	216	40.8	235
L	4		70.7	56	111.3	31	51.6	64	20.7	124	34.7	127	39.4	102	91.6	16	44.3	7	19.7	252	32.7	117	35.8	144

2004 NCAA March Madness Tournament Bracket

First Round March 18-19	Second Round March 20-21	Sweet 16 March 25-26	Elite 8 March 27-28	Final Four April 3	Championship April 5	Final Four April 3	Elite 8 March 27-28	Sweet 16 March 25-26	Second Round March 20-21	First Round March 18-19



TEACHER NAME			Lesson #
James Shafto			3
MODEL	CONTENT AREA	GRADE LEVEL	
Simulation	Statistics	Middle School	

CONCEPTUAL LENS	LESSON TOPIC
History Informs prediction	How does history inform prediction?

LEARNING OBJECTIVES *(from State/Local Curriculum)*

CCSS.MATH.CONTENT.HSS.MD.B.5
(+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
CCSS.MATH.CONTENT.HSS.MD.B.6
(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
CCSS.MATH.CONTENT.HSS.MD.B.7
(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
- *History informs prediction.* - *Multiple trials increase the chances of history accurately informing prediction.*	*How does history inform prediction?*

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
- Statistical anomalies are reduced with greater trials. - The rules of the NCAA tournament, namely that there are only 1 trial games, keep the odds high of upsets. - Rules can be changed by game makers to accomplish goals. - Excellent teams often lose.	- Students can analyze data and use it to adjust prediction strategies. - Students can compare and contrast differences in each other's data. - Students can interpret probability based on the context of the problem given. - Students can use historical data to make informed predictions. - Students can establish a mathematical and historical framework for making decisions.

GUIDING QUESTIONS *What questions will be asked to support instruction?* *Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding*		
Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
- How does - What emotions do you predict people feel when they win an upset, - Predict the emotions of fans who are fans of the winning team? - Predict the emotions of the fans of the losing team? - What is an upset? - Why are teams upset?	- What are strategies we can use to predict upsets? - How can you use history to adjust your ranking system and to increase prediction accuracy? - How can we use history to predict the impact of emotions on a given team? - How do emotions contribute to the result of a basketball game? - What role does coaching play in mitigating the impact of emotions on a game? - How do rule changes alter the way history informs prediction?	- How can we use history to predict the outcomes of games? - How do differences in the value of aspects of basketball change the results of predictions? - How does the past history of individual statisticians predictions inform and your likelihood of investing in their product? - What is the ideal emotional outlook, which will contribute to a better chance of winning a game? - How can changes to rules shift the manner we make predictions?

DIFFERENTIATION *(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.*			
Content	Process	Product	Learning Environment
	Students will simulate NCAA bracket and are given fake money to invest in each other's brackets.	Students have choice of what type of handbook they would like to work on.	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - ***This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students. – 15 minutes***

1. *Students watch a video of the top 5 teams to not win the tournament.*

http://www.ncaa.com/video/basketball-men/2015-02-17/high-five-best-teams-not-to-win-national-championship

2. *Socratic Seminar about why great teams lose centered around the question "how could we have predicted this loss?" and "how can we predict upsets?"*

Each student should employ a variation of the "close reading" strategy to accomplish the initial watching. Students will also be given statistics about each of the 5 teams. When all group members have annotated the data, the group should discuss notes and questions they have written during the close reading of the data and of the video.

Each group should craft five questions as a result of the close reading. Questions should represent higher levels of thinking.

The teacher should demonstrate Higher order thinking questions. Provide students with a copy of Blooms question wheel as needed. (Students will reference these questions during the Socratic Seminar)

3. Students discuss with each other – The teacher should encourage students to use other's comments in their own reasoning and to challenge each other's reasoning.

Explore - ***In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.***

The teacher will lead the students in a discussion of Socratic Seminar expectations and will hand out "academic language scripts (given the first day) for the students to use while discussing. Expectations will be posted on the board throughout the seminar.

Students are divided into two groups. One group will compose the inner circle of the Socratic Seminar, one group will form the outer circle of the socratic seminar. The inner circle members begin the dialogue while the outer circle members take notes about the dialogue, craft questions and observe one participant form the inner circle (Their partner for the seminar) They should take notes on their partner using the "socratic seminar fishbowl" handout. The leader, one student designated by the teacher, will begin the seminar with one provocative question. As students are working in groups, the teacher should review questions they have composed and suggest them to the leader to "launch" the seminar. Inner circle students will follow expectations for academic dialogue and respond in turn.

Opening questions may include but are not limited to:
Why do great teams lose?
What are the emotional elements of great teams losing?
Why do we care about underdogs (or don't care)?
The teacher should try to have students give opening questions.

Optional Task: How do rules change prediction strategies and the value of historical data?

Students watch the video of UNC-Duke 0-7 at half time.
http://shawnfury.blogspot.com/2011/01/time-duke-led-unc-7-0-at-halftime.html?_sm_au_=irVtf4vsnj7PsDw6

VTS of what's going on in the video.
Lead students to observe that there is no shot clock, no 3-point line etc.

Explain - ***Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.***

1. Breakout (Mini Performance Task) - Give each team a copy of the NCAA tournament rules, then have them pick whether they want to make the tournament more predictable or less predictable. In groups of 4 they have 30 minutes to change the rules to accomplish their goal.
2. Students create a quick presentation about how they would change the rules to make the tournament more or less predictable. They must explain why they decided more or less predictable and explain how their rule change affects the process.

Elaborate —***Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways.***

1. *Students discuss how rules affect prediction.*
2.

Evaluate: ***This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.***

(30 min) Students get together and adjust their prediction systems and work on the performance task. Students use their handbook to create a bracket of another year. The teacher will give them all the data, just like on day 1 and day 2. Students will each be given money to bet on the best bracket. The winning bracket explains their reasoning and what steps they used to decide the winners.

1. *Students present their predictability changes.*
2. *Close out by recapping what was learned that day. Then ask the question,*
    a. *In basketball, how does history inform prediction?*
    b. What is unique about basketball that allows us to accurately predict games?

NCAA Bracketology Day 3

• • •

History informs prediction
The Biggest Losers

Seminar - NCAA Basketball - Upsets

http://www.infinitelooper.com/?v=DO5Saq4QOZM&p=n#/805;1181

Take notes on what you observe in the video -

Seminar - NCAA Basketball - Upsets

http://www.ncaa.com/video/basketball-men/2015-02-17/high-five-best-teams-not-to-win-national-championship

Use the close reading strategy to take notes on the video

Groupings

Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**	**Group 6**	**Group 7**
Vann	Eli	TJ	Samuel	Thomas**	Asha	Cole
Max	Carson	Lucas	Valerio	Caleb	Jack	Levi

Seminar - NCAA Basketball - Lehigh Vs Duke

Reflection & Discussion - How can we use history to inform predictions of upsets

Close Reading Strategy

Watch the video and take notes using the close reading strategy.

Questioning

Share with your partners what you observed in the video. Center your conversation around the question “How does History inform prediction?”

Take Student Questions. Others include:

1. What happened in the video you watched?
2. How might the events have impacted other viewers? Why?
3. If the teams had played each other before, how might the game have ended differently?
4. How might these events have been predicted before the game began?
5. How does history inform prediction?

Work on your handbook - 45 minutes

Groups of 2.

Begin working on the steps you'll have your client take to develop their bracket.

Simulation Rules

- You will each receive $1million every day to bid where you deem fit.
- Every day you must spend 50% of your total money.
- The winner of the bracket challenge will receive 25% of the money bet on the pot.
- The rest of the money is divided up proportionally and distributed to the wealthy clients who bet on him or her.
- The Client with the most money at the end of the game wins.

Predictions - Groups of 2 - 15 minutes

1. Fill out your bracket with your partner.
2. Prepare a 1 minute presentation explaining to the wealthy clients of the room why we should bid on your bracket.

Biding

1. Bet money on who you think has the best bracket.
2. Run the simulation.
3. Who actually won.
4. Tally up the scores
5. The game maker Divides up the money according to the game rules.

VTS - Rule Changes

Min Performance Task - Look at the rules of the NCAA. Pick one rule to change so that basketball will become more or less predictable. Explain how this rule change will make the game more or less predictable.

VTS - Visual Thinking Strategies Procedure

1. Look carefully at the data
2. Make comments on what you observe
3. Back up your ideas with evidence
4. Listen to and consider the views of others
5. Discuss multiple possible interpretations.

Duke vs UNC : 0 - 7 at halftime.

http://shawnfury.blogspot.com/2011/01/time-duke-led-unc-7-0-at-halftime.html?_sm_au_=irVtf4vsnj7PsDw6

Rule Changes - 15 minutes Close Reading

Read the NCAA Basketball rules

Mini Performance Task - Look at the rules of the NCAA. Pick one rule to change so that basketball will become more or less predictable.

Explain how this rule change will make the game more or less predictable.

Rule Changes - 20 minutes Discussion of rule change

Read the NCAA Basketball rules

Mini Performance Task - Look at the rules of the NCAA. Pick one rule to change so that basketball will become more or less predictable.

Explain how this rule change will make the game more or less predictable.

Create a presentation explaining why you made your rule change and what its effect will be.

Rule Changes - 15 minutes for presentations

Read the NCAA Basketball rules

Mini Performance Task - Look at the rules of the NCAA. Pick one rule to change so that basketball will become more or less predictable.

Explain how this rule change will make the game more or less predictable.

Create a presentation explaining why you made your rule change and what its effect will be.

Closing

How does history inform prediction?

Duke VS Lehigh

Ken Pom Pythag

													Strength of Schedule						NCSOS	
Rank	Team	Conf	W-L	Pyth	AdjO		AdjD		AdjT		Luck		Pyth		OppO		OppD		Pyth	
74	Lehigh 15	Pat	27-8	0.7314	106.8	71	97.9	102	68.4	67	-0.026	239	0.3837	280	99.1	285	103.3	280	0.4113	258
21	Duke 2	ACC	27-7	0.8666	114.5	10	97.3	81	67.6	96	0.058	43	0.695	22	105.2	22	97.9	20	0.6857	19

Ken Pom - Four Factors Data

		Offense								Defense									
Team	Conf	AdjTempo		AdjOE		eFG%		TO%		OR%		FTRate		AdjDE		eFG%		TO%		OR%		FTRate	
Duke 4	ACC	68.6	193	119.3	7	53.7	34	14.3	5	33.2	59	40.6	79	100.7	107	49.5	148	17.4	223	34.6	330	25.3	10
Lehigh	Pat	68.8	175	104.5	157	52.1	70	19.3	255	29.1	193	31.7	299	105.7	209	51.1	229	18.6	139	29.3	144	28.8	34

Ken Pom - Efficiency

		Tempo		Avg. Poss Length				Offensive Efficiency				Defensive Efficiency					
Team	Conf	Adjusted		Raw		Offense		Defense		Adjusted		Raw		Adjusted		Raw	
Duke	ACC	68.6	193	68.4	207	17.6	197	17.3	197	119.3	7	117.7	4	100.7	107	105.7	219
Lehigh	Pat	68.8	175	67.1	270	17.3	168	18.2	324	104.5	157	104.8	148	105.7	209	103.8	168

	AP Poll							Coaches Poll							
LETTER	Rank	Prev	Team	Votes	1st Place	Conference	LETTER	Rank	Prev	Team	Wins	Losses	Votes	1st Place	Conference
A	1	5	**Louisville**	1740	45	Big East	A	1	5	**Louisville**	31	6	752	14	Big East
B	2	1	**North Caroli**	1654	11	ACC	B	3	1	**North Caroli**	33	4	727	6	ACC
C	3	4	**Memphis**	1621	11	C-USA	C	2	3	**Memphis**	33	4	728	11	C-USA
D	4	2	**Pittsburgh**	1585	3	Big East	D	4	2	**Pittsburgh**	31	5	692	0	Big East
E	5	3	**Connecticut**	1519	1	Big East	E	6	4	**Connecticut**	31	5	621	0	Big East
F	6	9	**Duke**	1444	0	ACC	F	5	8	**Duke**	30	7	638	0	ACC
G	7	6	**Oklahoma**	1281	0	Big 12	G	8	7	**Oklahoma**	30	6	541	0	Big 12
H	8	7	**Michigan Stat**	1257	0	Big Ten	H	7	6	**Michigan Stat**	31	6	569	0	Big Ten
I	9	14	**Missouri**	1131	0	Big 12	I	9	15	**Missouri**	31	7	505	0	Big 12
J	10	12	**Gonzaga**	1060	0	West Coast	J	10	12	**Gonzaga**	28	6	488	0	West Coast
K	11	10	**Villanova**	1049	0	Big East	K	12	13	**Villanova**	30	8	402	0	Big East
L	12	8	**Wake Forest**	997	0	ACC	L	11	9	**Wake Forest**	24	7	429	0	ACC
M	13	18	**Syracuse**	903	0	Big East	M	15	20	**Syracuse**	28	10	373	0	Big East
N	14	11	**Kansas**	874	0	Big 12	N	13	11	**Kansas**	27	8	400	0	Big 12
O	15	13	**Washington**	751	0	Pac 10	O	14	10	**Washington**	26	9	389	0	Pac 10
P	16	22	**Florida State**	667	0	ACC	P	16	22	**Florida State**	25	10	293	0	ACC
Q	17	24	**Purdue**	643	0	Big Ten	Q	18	24	**Purdue**	27	10	231	0	Big Ten
R	18	15	**UCLA**	491	0	Pac 10	R	17	14	**UCLA**	26	9	243	0	Pac 10
S	19	23	**Arizona State**	381	0	Pac 10	S	19	23	**Arizona State**	25	10	212	0	Pac 10
T	20	19	**Xavier, Ohio**	351	0	A-10	T	22	19	**Xavier, Ohio**	27	8	124	0	A-10
U	21	20	**Louisiana Sta**	292	0	SEC	U	20	16	**Louisiana Sta**	27	8	192	0	SEC
V	22	16	**Butler**	284	0	Horizon	V	23	17	**Butler**	26	6	104	0	Horizon
W	23	21	**Marquette**	277	0	Big East	W	24	21	**Marquette**	25	10	80	0	Big East
X	24	17	**Clemson**	264	0	ACC	X	21	18	**Clemson**	23	9	132	0	ACC
Y	25	29	**Utah**	150	0	Mountain West	Y	28	31	**Utah**	24	10	26	0	Mountain West
Z	26	30	**West Virginia**	89	0	Big East	Z	30	0	**West Virginia**	23	12	22	0	Big East
	27	0	**Southern Cali**	64	0	Pac 10	1A	29	0	**Southern Cali**	22	13	24	0	Pac 10
	28	26	**Illinois**	63	0	Big Ten	1B	26	25	**Illinois**	24	10	37	0	Big Ten
	29	44	**Ohio State**	53	0	Big Ten	1C	27	0	**Ohio State**	22	11	31	0	Big Ten
	30	25	**Brigham You**	32	0	Mountain West	1D	31	27	**Brigham You**	25	8	7	0	Mountain West
	31	0	**Mississippi St**	31	0	SEC	1E	35	0	**Mississippi St**	23	13	3	0	SEC
	32	33	**Utah State**	28	0	WAC	1F	25	28	**Utah State**	30	5	40	0	WAC
	33	28	**St. Mary's, C**	11	0	West Coast	1G	32	26	**St. Mary's, C**	28	7	6	0	West Coast
	35	0	**Temple**	7	0	A-10	1J	33	0	**Temple**	22	12	5	0	A-10
	37	37	**Siena**	5	0	MAAC	1K	37	35	**Siena**	27	8	2	0	MAAC

Letter	Seed	Team	Conf	Adjusted Tempo		Adjusted Offensive Efficiency		effective Field Goal%		Turn Overs %		Offensive Rebound %		Free Throw Rate		Ajusted Defense		Effective Field Goal %		Turn Over %		Offensive Rebound %		Free Throw Rate	
A	1	**Louisville 1**	**BE**	67.6	115	109.6	50	52.7	49	19.7	138	34.6	102	31.4	294	86.9	2	44.3	12	23	43	31.7	124	30.2	40
H	2	**Michigan St.**	**B10**	67.3	126	113.2	22	49.8	139	20.7	198	40.7	6	41	50	90.4	8	47.2	85	19.9	190	27.3	11	36.5	178
E	1	**Connecticut 1**	**BE**	68.4	87	113.8	18	51.3	81	18.1	50	39.9	11	46.4	6	87.8	3	42.4	2	16.2	336	30.1	55	19.5	1
I	3	**Missouri 3**	**B12**	71.3	21	115.9	10	52.8	47	16	6	34.3	116	36.6	172	92.8	20	46.4	53	24.8	10	34.5	248	39.9	253
D	1	**Pittsburgh 1**	**BE**	66	186	119.5	2	52.9	42	18	44	42	2	33	261	93.2	24	46.5	59	18.8	269	29.7	45	30.2	42
K	3	**Villanova 3**	**BE**	69.2	63	112.8	25	50.8	100	18.8	70	36.5	52	41.9	40	90.8	13	47.3	89	21.4	113	29.9	49	38.8	230
B	1	**North Caroli**	**ACC**	73.9	8	122.4	1	52.8	45	16.5	10	38.9	21	39.8	75	92.9	21	46.6	62	20.4	156	31.7	121	25.4	7
G	2	**Oklahoma 2**	**B12**	67.7	111	117	4	55.2	5	19.7	136	36.9	46	46.5	5	94.1	34	45.8	38	18.1	301	31.8	126	28.8	21

AP Poll									Coaches Poll																	
LETTER	Rank	Prev	Votes	1st Place					LETTER	Rank	Prev	Wins	Losses	Votes	1st Place											
A	1	5	1740	45					A	1	5	31	6	752	14											
B	2	1	1654	11					B	3	1	33	4	727	6											
C	3	4	1621	11					C	2	3	33	4	728	11											
D	4	2	1585	3					D	4	2	31	5	692	0											
E	5	3	1519	1					E	6	4	31	5	621	0											
F	6	9	1444	0					F	5	8	30	7	638	0											
G	7	6	1281	0					G	8	7	30	6	541	0											
H	8	7	1257	0					H	7	6	31	6	569	0											
I	9	14	1131	0					I	9	15	31	7	505	0											
J	10	12	1060	0					J	10	12	28	6	488	0											
K	11	10	1049	0					K	12	13	30	8	402	0											
L	12	8	997	0					L	11	9	24	7	429	0											
M	13	18	903	0					M	15	20	28	10	373	0											
N	14	11	874	0					N	13	11	27	8	400	0											
O	15	13	751	0					O	14	10	26	9	389	0											
P	16	22	667	0					P	16	22	25	10	293	0											
Q	17	24	643	0					Q	18	24	27	10	231	0											
R	18	15	491	0					R	17	14	26	9	243	0											
S	19	23	381	0					S	19	23	25	10	212	0											
T	20	19	351	0					T	22	19	27	8	124	0											
U	21	20	292	0					U	20	16	27	8	192	0											
V	22	16	284	0					V	23	17	26	6	104	0											
W	23	21	277	0					W	24	21	25	10	80	0											
X	24	17	264	0					X	21	18	23	9	132	0											
Y	25	29	150	0					Y	28	31	24	10	26	0											
Z	26	30	89	0					Z	30	0	23	12	22	0											
	27	0	64	0					1A	29	0	22	13	24	0											
	28	26	63	0					1B	26	25	24	10	37	0											
	29	44	53	0					1C	27	0	22	11	31	0											
	30	25	32	0					1D	31	27	25	8	7	0											
	31	0	31	0					1E	35	0	23	13	3	0											
	32	33	28	0					1F	25	28	30	5	40	0											
	33	28	11	0					1G	32	26	28	7	6	0											
	35	0	7	0					1J	33	0	22	12	5	0											
	37	37	5	0					1K	37	35	27	8	2	0											

Letter	Seed			Adjusted Tempo		Adjusted Offensive Efficiency		effective Field Goal%		Turn Overs %		Offensive Rebound %		Free Throw Rate		Ajusted Defense		Effective Field Goal %		Turn Over %		Offensive Rebound %		Free Throw Rate	
A	1			67.6	115	109.6	50	52.7	49	19.7	138	34.6	102	31.4	294	86.9	2	44.3	12	23	43	31.7	124	30.2	40
H	2			67.3	126	113.2	22	49.8	139	20.7	198	40.7	6	41	50	90.4	8	47.2	85	19.9	190	27.3	11	36.5	178
E	1			68.4	87	113.8	18	51.3	81	18.1	50	39.9	11	46.4	6	87.8	3	42.4	2	16.2	336	30.1	55	19.5	1
I	3			71.3	21	115.9	10	52.8	47	16	6	34.3	116	36.6	172	92.8	20	46.4	53	24.8	10	34.5	248	39.9	253
D	1			66	186	119.5	2	52.9	42	18	44	42	2	33	261	93.2	24	46.5	59	18.8	269	29.7	45	30.2	42
K	3			69.2	63	112.8	25	50.8	100	18.8	70	36.5	52	41.9	40	90.8	13	47.3	89	21.4	113	29.9	49	38.8	230
B	1			73.9	8	122.4	1	52.8	45	16.5	10	38.9	21	39.8	75	92.9	21	46.6	62	20.4	156	31.7	121	25.4	7
G	2			67.7	111	117	4	55.2	5	19.7	136	36.9	46	46.5	5	94.1	34	45.8	38	18.1	301	31.8	126	28.8	21

TEACHER NAME			Lesson #
James Shafto			3
MODEL	CONTENT AREA	GRADE LEVEL	
Simulation	Statistics	Middle School	
CONCEPTUAL LENS		LESSON TOPIC	
History Informs prediction		How does history inform prediction?	

LEARNING OBJECTIVES *(from State/Local Curriculum)*

CCSS.MATH.CONTENT.HSS.MD.B.5
(+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.
CCSS.MATH.CONTENT.HSS.MD.B.6
(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
CCSS.MATH.CONTENT.HSS.MD.B.7
(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

THE ESSENTIAL UNDERSTANDING *(What is the overarching idea students will understand as a result of this lesson?*	THE ESSENTIAL QUESTION *(What question will be asked to lead students to "uncover" the Essential Understanding)*
- *History informs prediction.*	*How does history inform prediction?*

CONTENT KNOWLEDGE (What factual information will students learn in this lesson?)	PROCESS SKILLS (What will students be able to do as a result of this lesson?)
- Opinions about the value of certain elements of basketball result in slightly different predictions about winners. - Rules can be changed by game makers to accomplish goals. - Good coaching contributes to teams winning games. - Teams can use data to predict their opponents actions and make informed decisions to win games.	- Students can analyze data and use it to adjust prediction strategies. - Students can compare and contrast differences in each other's data. - Students can interpret probability based on the context of the problem given. - Students can use historical data to make informed predictions. - Students can establish a mathematical and historical framework for making decisions.

GUIDING QUESTIONS *What questions will be asked to support instruction?* *Include both "lesson plan level" questions as well as questions designed to guide students to the essential understanding*		
Pre-Lesson Questions:	During Lesson Questions:	Post Lesson Questions:
- How does - What emotions do you predict people feel when they win an upset, - Predict the emotions of fans who are fans of the winning team? - Predict the emotions of the fans who are fans of the losing team? - What is an upset? - Why are teams upset? -	- How can you use history to adjust your ranking system and to increase prediction accuracy? - How can we use history to predict the impact of emotions on a given team? - Why is tempo not important in predicting winners and losers? - How does tempo contribute to statistical anomalies? - What type of tempo should an underdog team attempt in order to increase their chances of winning? - What is the law of averages? - What characteristics about basketball allow us to accurately predict games?	- How can we use history to predict the outcomes of games? - How do differences in personal value judgments of aspects of basketball change predictions? - How can coaches adjust pace of play to raise the chances of winning a game? - How does history inform prediction? - What characteristics of a game allow history to accurately inform prediction?

DIFFERENTIATION *(Describe how the planned learning experience has been modified to meet the needs of gifted learners. Note: Modifications may be in one or more of the areas below. Only provide details for the area(s) that have been differentiated for this lesson.*			
Content	Process	Product	Learning Environment
	Students will simulate NCAA bracket and are given fake money to invest in each other's brackets.	Students have choice of what type of handbook they would like to work on.	

PLANNED LEARNING EXPERIENCES

(What will the teacher input? What will the students be asked to do? For clarity, please provide detailed instructions)

Engage and Connect - ***This phase focuses on piquing students' interest and helping them access prior knowledge. This is the introduction to the lesson that motivates or hooks the students. – 15 minutes***

1. *Students enter the class and watch a video of UNC playing vs Virginia in ACC conference play. They should take notes on observations they see in the video and what sticks out to them. The teacher will then ask VTS questions to stimulate responses about how history informs prediction, particularly with respect to whether pace of a game contributes to prediction. (Namely that it does not.)*

https://www.youtube.com/watch?v=yTThyQPoXxY

VTS procedure should be posted on the board.

- What's going on in this video?
- What do you see that makes you say that?
- What more can we find.

Students are asked to

- Look carefully at the video
- Talk about what they observe
- Back up their ideas with evidence
- Listen to and consider the views of others
- Discuss multiple possible interpretations

The teacher should be

- Paraphrase comments neutrally
- Point at the area being discussed
- Linking and framing student comments to direct them to the theme of "History informs prediction."
- Encourage students to predict why they don't

Hand out to students a copy of UNC and Virginia's game time. Let them look over the data for a minute then make observations on the data.

What do they notice about pace of play?

Ask the students, "In your groups, develop a strategy a coach can implement, using pace of play to have a better chance of winning a game. Students will have 10 minutes to create their strategy and a short presentation outlining their strategy and the mathematics behind it.

Students will present their strategy, and then discuss the merits of each student's strategy.

Explore - ***In this phase, the students have experiences with the concepts and ideas of the lesson. Students are encouraged to work together without direct instruction from the teacher. The teacher acts as a facilitator. Students observe, question, and investigate the concepts to develop fundamental awareness of the nature of the materials and ideas.***

1. The teacher explains to the students that they will be doing a basketball simulation

    a. Each student will receive a data from 8 teams in the elite 8 of a mystery tournament.
    b. They will then make brackets predicting who will win the tournament.
    c. Students will then have 5 minutes presentation their handbook, why it works and why you, the client should invest in them.
    d. Students (and any parents present) invest in the winning teams. After bets are cast, money is distributed to the winners.
    e. After all students have presented, go through each game and show the actual scores and winners of each game. Students will use the rules of "Fantasy basketball to score themselves.

Explain - ***Students communicate what they have learned so far and figure out what it means. This phase also provides an opportunity for teachers to directly introduce a concept, process, or skill to guide students toward a deeper understanding.***

1. Last chance for students to adjust their prediction systems, if necessary. For students who have finished, have them do research on other methods of prediction like "adjusted Pythagorean system."

Elaborate —*Allow students to use their new knowledge and continue to explore its implications. At this stage students expand on the concepts they have learned, make connections to other related concepts, and apply their understandings to the world around them in new ways*

Final Simulation

a. Each student will receive a data from 8 teams in the elite 8 of a mystery tournament.
b. They will then make brackets predicting who will win the tournament.
c. Students will then have 5 minutes presentation their handbook, why it works and why you, the client should invest in them.
d. Students (and any parents present) invest in the winning teams. After bets are cast, money is distributed to the winners.
e. After all students have presented, go through each game and show the actual scores and winners of each game. Students will use the rules of "Fantasy basketball to score themselves.
f. Money will be delivered to the winning teams.

Evaluate: ***This phase assesses both learning and teaching and can use a wide variety of informal and formal assessment strategies.***

1. *Close out by recapping what was learned over the course of the week. Then ask the question,*
    a. *In basketball, how does history inform prediction?*
    b. What is unique about basketball that allows us to accurately predict games?

Optional activity if run out of time:

Compare basketball statistics, football statistics and soccer statistics.
Give kids a copy of pregame stats from a basketball, football, soccer and baseball game.

NCAA Bracketology Day 4

•••

History informs prediction
Pace and Upsets

VTS - Visual Thinking Strategies Procedure

1. Look carefully at the data
2. Make comments on what you observe
3. Back up your ideas with evidence
4. Listen to and consider the views of others
5. Discuss multiple possible interpretations.

Video - UNC vs Virginia

Full Seminar : UNC - Virginia Ken Pom Data

Socratic Seminar - Close Reading Technique

Article : UNC vs Virginia Ken Pom Data

- Craft 3 questions about the data to bring to the larger group. Aligne questions with the concept of Prediction.

Take out “Close reading technique”.

Socratic Seminar Instructions.

Take out “Academic Language Scripts”

Hand out “Student Observation sheet for Socratic Seminar”

Inner Circle - The inner circle discusses the article with each other using professional discourse. The goal is to develop concepts and ideas, not debate topics.

Outer Circle - The outer circle listens and takes notes on what the inner circle is saying.

After a time, the outer and inner circle swap.

Rules for Professional Discourse

- Speak respectfully
- Take turns
- Use other elaborate on other people's ideas
- Connect the article to your own experience
- Remember the concept "History informs prediction."
- Remember: This is not a debate.

Work on Performance Task - 1 hour 30 minutes

Finish your performance task

Simulation Rules

- You will each receive $1million every day to bid where you deem fit.
- Every day you must spend 50% of your total money.
- The winner of the bracket challenge will receive 25% of the money bet on the pot.
- The rest of the money is divided up proportionally and distributed to the wealthy clients who bet on him or her.
- The Client with the most money at the end of the game wins.
- The wealthy parents of the wealthy clients will also be bidding.

Predictions - Groups of 2 - 15 minutes

1. Fill out your bracket with your partner.
2. Prepare a 1 minute presentation explaining to the wealthy clients of the room why we should bid on your bracket.

Biding

1. Bet money on who you think has the best bracket.
2. Run the simulation.
3. Who actually won.
4. Tally up the scores
5. The game maker Divides up the money according to the game rules.

Predicting the 2017 Top 5

Use the following links and projections to create your own pre-season top 5 for the 2016-17 NCAA basketball season. Analyze the data, then decide for yourself who makes the cut.

Rank	Team	Reason
1		
2		
3		
4		
5		

http://kenpom.com/blog/the-preseason-ap-poll-is-great/

http://www.sbnation.com/college-basketball/2016/4/5/11362474/2016-2017-college-basketball-early-ranking-top-25-villanova-kentucky-duke

http://espn.go.com/mens-college-basketball/story/_/id/15123601/duke-blue-devils-kentucky-wildcats-college-basketball-top-25-2016-2017

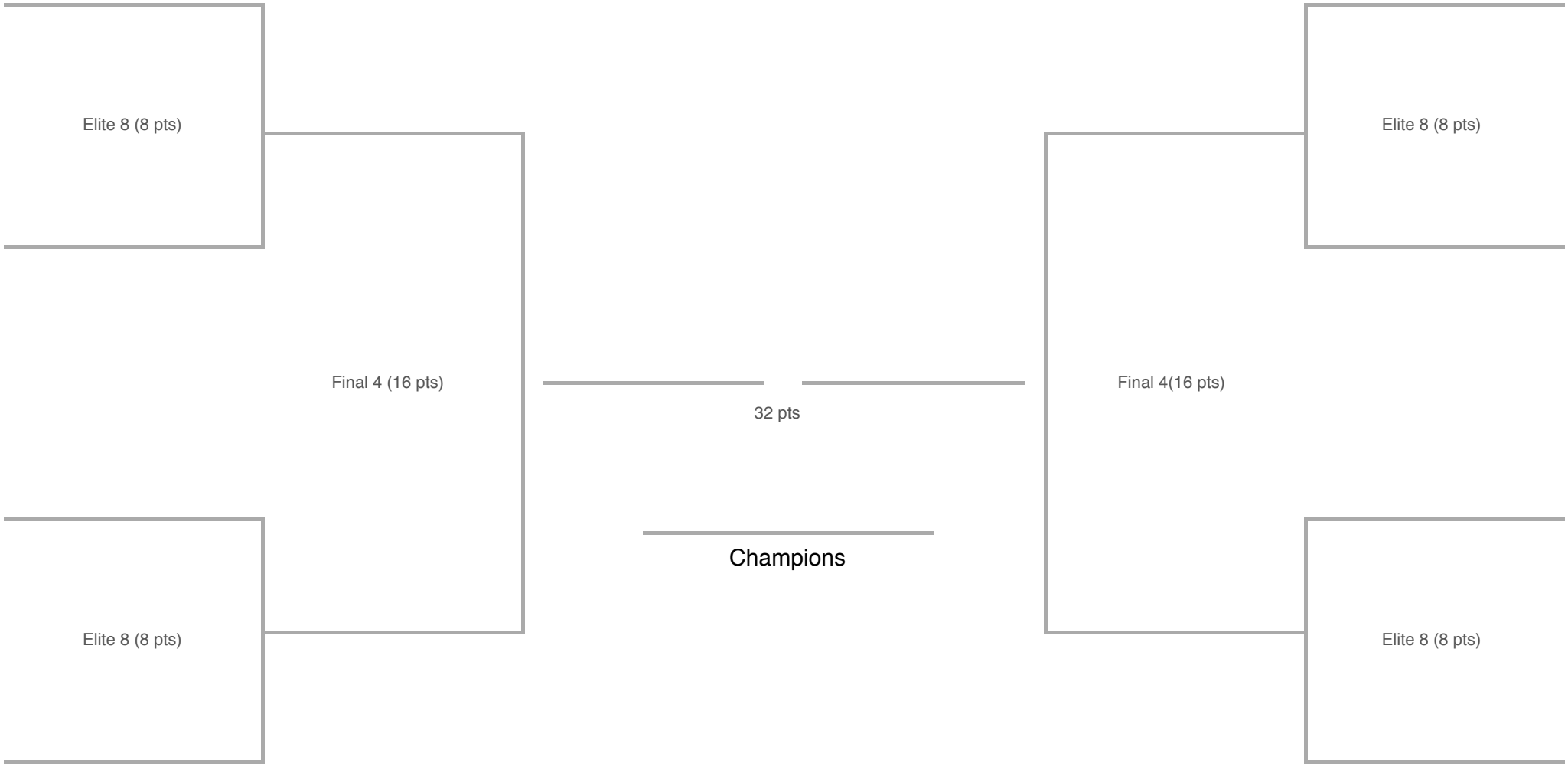
http://www.cbssports.com/college-basketball/news/duke-our-preseason-no-1-is-the-2017-national-title-betting-favorite/

http://www.cbssports.com/college-basketball/news/duke-is-no-1-in-the-ridiculously-early-preseason-top-25-and-one/

http://www.usatoday.com/story/sports/ncaab/2016/04/05/college-basketball-early-preseason-top-25-duke-kentucky/82517880/

http://collegespun.com/acc/louisville-big-east/louisville-kentucky-top-ken-pomeroys-preseason-top-10-for-2016-17-college-basketball-season

NCAA Bracket Challenge



AP Top 25

LETTER	RK	TEAM	RECORD	PTS
A	11	Butler	29-3	1,004
B	22	Clemson	24-9	364
C	16	Connecticut	24-8	670
D	23	Davidson	26-6	253
E	14	Drake	28-4	794
F	9	Duke	27-5	1,223
G	8	Georgetown	27-5	1,271
H	24	Gonzaga	25-7	232
I	4	Kansas (1)	31-3	1,596
J	13	Louisville	24-8	894
K	25	Marquette	24-9	174
L	2	Memphis (13)	33-1	1,710
M	18	Michigan State	25-8	523
N	1	North Carolina (53)	32-2	1,779
O	15	Notre Dame	24-7	672
P	17	Pittsburgh	26-9	586
Q	20	Purdue	24-8	418
R	10	Stanford	26-7	1,122
S	5	Tennessee	29-4	1,449
T	7	Texas	28-6	1,390
U	3	UCLA (5)	31-3	1,674
V	19	Vanderbilt	26-7	493
W	21	Washington State	24-8	377
X	6	Wisconsin	29-4	1,412
Y	12	Xavier	27-6	957

USA Today Coaches Poll

LETTER	RK	TEAM	RECORD	PTS
A	10	Butler	29-3	499
B	22	Clemson	24-9	123
C	17	Connecticut	24-8	239
D	23	Davidson	26-6	108
E	14	Drake	28-4	310
F	9	Duke	27-5	535
G	8	Georgetown	27-5	538
H	24	Indiana	25-7	106
I	4	Kansas	31-3	682
J	13	Louisville	24-8	358
K	24	Marquette	24-9	106
L	3	Memphis (3)	33-1	728
M	20	Michigan State	25-8	194
N	1	North Carolina (23)	32-2	767
O	15	Notre Dame	24-7	309
P	19	Pittsburgh	26-9	216
Q	18	Purdue	24-8	218
R	11	Stanford	26-7	476
S	6	Tennessee	29-4	616
T	7	Texas	28-6	581
U	2	UCLA (5)	31-3	735
V	16	Vanderbilt	26-7	246
W	21	Washington State	24-8	149
X	5	Wisconsin	29-4	630
Y	12	Xavier	27-6	373

KEN POM PYTHAG

	Rank	Team	Conf	W-L	Pyth	AdjO		AdjD		AdjT		Luck		Pyth		OppO		OppD		Pyth	
1A	138	American 15	Pat	21-12	0.5522	106.9	81	105	220	62	320	0.045	67	0.4162	231	99.1	295	102	158	0.452	214
1B	28	Arizona 10	P10	19-15	0.8518	114.2	13	98.1	79	65	240	-0.077	326	0.7702	1	108.3	1	97.5	2	0.7221	10
1C	38	Arkansas 9	SEC	23-12	0.8207	110.4	46	96.7	62	67.9	132	0.009	152	0.6569	53	106.5	20	100.6	98	0.4722	182
1D	164	Austin Peay 15	OVC	24-11	0.4894	103	153	103.4	186	67.2	154	0.084	17	0.371	274	102.1	172	106.9	335	0.6555	31
1E	41	Baylor 11	B12	21-11	0.8144	114.5	11	100.6	129	71.9	22	-0.028	243	0.6638	48	104.8	71	98.8	22	0.3797	289
1F	127	Belmont 15	ASun	25-9	0.5858	107.4	73	104.2	202	70.1	56	0.075	26	0.3923	253	100.2	258	104	251	0.5227	124
1G	132	Boise St. 14	WAC	25-9	0.5736	106.5	93	103.8	194	72.2	19	0.086	16	0.4145	232	101.6	192	104.7	288	0.3894	281
A	19	Butler 7	Horz	30-4	0.8824	113.4	21	95.1	39	61.1	327	0.003	161	0.565	111	102.4	152	100.1	75	0.6338	39
1I	36	BYU 8	MWC	27-8	0.8331	105.5	112	91.7	11	69.3	81	0.027	104	0.5289	137	102.5	139	101.5	143	0.4167	256
1J	96	Cal St. Fullerton 14	BW	24-9	0.668	110	49	103.5	189	73.3	13	-0.009	195	0.3943	249	100.3	249	104.1	255	0.4285	241
1K	288	Coppin St. 16	MEAC	16-21	0.1998	92.9	307	104.8	216	64.1	279	0.064	37	0.3566	291	98	320	103.1	200	0.6523	32
1L	122	Cornell 14	Ivy	22-6	0.5991	108.7	61	104.9	219	69	91	0.087	15	0.3661	280	98.6	311	103.4	217	0.4513	216
1M	86	George Mason 12	CAA	23-11	0.7056	108	68	100.1	115	63	299	-0.009	196	0.4908	165	101.2	206	101.6	146	0.56	84
1N	8	Georgetown 2	BE	28-6	0.9327	113.2	24	90.1	6	62.2	316	0.029	99	0.6992	24	106.4	23	98.9	27	0.4757	176
1O	29	Indiana 8	B10	25-8	0.8505	112	35	96.3	54	68	126	0.038	83	0.6334	69	104.6	78	99.8	61	0.4363	235
1P	23	Kansas St. 11	B12	21-12	0.8713	113.4	20	96	52	71.3	31	-0.048	288	0.6911	29	105.8	42	98.7	20	0.4178	254
1Q	45	Kent St. 9	MAC	28-7	0.8016	105.5	111	93.5	25	66.6	175	0.075	25	0.5306	135	102.1	171	101	114	0.5151	132
1R	67	Kentucky 11	SEC	18-13	0.7464	106.4	95	96.9	65	63.6	291	0.011	146	0.6361	65	105.3	59	100.3	80	0.4365	233
1S	39	Miami FL 7	ACC	23-11	0.8206	110.6	43	96.9	66	67.4	144	-0.003	177	0.6616	50	104.4	83	98.5	14	0.3615	302
1T	31	Mississippi St. 8	SEC	23-11	0.8489	106.4	97	91.6	10	68.2	115	-0.042	276	0.6344	68	106.1	37	101.1	120	0.4461	224
1U	298	Mississippi Valley St. 1	SWAC	17-16	0.1785	91.6	319	104.6	211	64.7	254	0.116	2	0.2935	327	97.3	329	105	302	0.7747	4
1V	163	Mount St. Mary's 16	NEC	19-15	0.4926	98.6	218	98.9	95	67.9	131	0.016	128	0.3917	255	100.9	222	104.8	293	0.5302	117

1W	43	Oklahoma 6	B12	23-12	0.8079	107	80	94.5	35	64.5	263	0.077	23	0.7106	14	106.6	16	98.6	16	0.4863	162	
1X	78	Oral Roberts 13	Sum	24-9	0.7264	102.5	164	94.1	31	65.4	221	0.032	95	0.5062	152	104.1	92	103.8	242	0.7213	11	
1Y	40	Oregon 9	P10	18-14	0.8146	117.1	7	102.9	180	67.3	148	-0.034	258	0.7145	11	106.5	19	98.3	11	0.4891	160	
1Z	119	Portland St. 16	BSky	23-10	0.6045	106.8	84	102.9	179	68	123	0.062	40	0.421	224	101.7	188	104.5	273	0.6012	60	
2A	47	Saint Joseph's 11	A10	21-13	0.7971	113.2	23	100.5	125	65	243	-0.068	318	0.6443	60	105.2	63	99.9	68	0.5406	108	
2B	49	Saint Mary's 10	WCC	25-7	0.7916	106.1	102	94.4	34	67.5	142	0.03	97	0.4871	170	101.5	198	102	155	0.5406	107	
2C	113	San Diego 13	WCC	22-14	0.6173	99.9	199	95.9	49	64.6	259	0.046	65	0.5113	147	102.3	154	101.9	154	0.541	106	
2D	87	Siena 13	MAAC	23-11	0.7038	106.7	87	99	97	68.8	97	0.036	87	0.4844	173	103.2	115	103.7	238	0.6051	54	
2E	68	South Alabama 10	SB	26-7	0.7453	110.4	45	100.6	127	66.6	173	0	166	0.4525	193	101.9	180	103.6	227	0.4924	158	
2F	55	Temple 12	A10	21-13	0.7826	111	41	99.3	102	65.2	237	-0.019	215	0.6446	59	105.7	44	100.3	83	0.5851	68	
2G	21	Texas A&M 9	B12	25-11	0.8776	109.7	51	92.4	17	63.2	296	0.005	158	0.6871	32	105.6	48	98.6	18	0.3729	295	
2H	130	UMBC 15	AE	24-9	0.5779	110.8	42	107.8	277	65	242	0.055	47	0.4213	223	99.9	267	102.7	187	0.5884	65	
2I	46	UNLV 8	MWC	27-8	0.7991	109.4	55	97	68	65.2	235	0.081	21	0.5707	108	102.5	145	100	70	0.4664	190	
2J	32	USC 6	P10	21-12	0.8488	108.5	62	93.4	24	66.7	166	-0.004	182	0.7262	4	107.2	5	98.5	15	0.5196	127	
2K	178	UT Arlington 16	Slnd	21-12	0.425	100.5	187	103.2	183	69.9	67	0.046	64	0.3965	244	99	296	102.7	181	0.3394	312	
2L	42	Villanova 12	BE	22-13	0.8104	107.3	75	94.6	37	69.2	84	0.037	85	0.7031	21	106.9	10	99.1	40	0.4505	217	
2M	22	West Virginia 7	BE	26-11	0.8725	111.7	36	94.5	36	65.2	231	-0.017	212	0.6892	31	106.1	34	99	35	0.4192	252	
2N	37	Western Kentucky 12	SB	29-7	0.8241	110.5	44	96.6	59	69.9	66	-0.02	219	0.4869	171	102.2	163	102.6	179	0.5152	131	
2O	104	Winthrop 13	BSth	22-12	0.6316	96.8	250	92.4	16	63.1	297	-0.001	168	0.4768	175	103.7	103	104.6	276	0.7276	9	
B	16	Clemson 5	ACC	24-10	0.8957	111.5	39	92.5	18	69.2	85	-0.045	283	0.7072	19	107.2	6	99.3	47	0.487	161	
C	26	Connecticut 4	BE	24-9	0.8631	113.9	16	97.1	69	68.4	110	0	165	0.6688	45	105.5	50	99.3	45	0.4857	163	
D	7	Davidson 10	SC	29-7	0.9359	117.6	5	93.1	21	67.4	146	-0.036	261	0.596	97	103.8	97	100.4	86	0.8049	1	
E	15	Drake 5	MVC	28-5	0.8968	119.5	4	99	99	64.3	271	0.012	141	0.6116	89	103.6	108	99.6	57	0.4944	154	
F	10	Duke 2	ACC	28-6	0.9267	113.4	19	91	8	73	16	-0.006	185	0.7086	16	106.9	9	98.9	30	0.558	88	
G	91	Georgia 14	SEC	17-17	0.6828	102.6	161	96	51	65.9	204	-0.032	252	0.6526	56	106.3	28	100.6	97	0.4044	266	
H	27	Gonzaga 7	WCC	25-8	0.861	112.7	28	96.2	53	68.1	120	-0.03	245	0.5509	120	102.2	158	100.4	89	0.6599	28	
I	1	Kansas 1	B12	37-3	0.9753	120	2	87.1	1	67.8	136	0.012	139	0.7174	8	107.4	2	99	33	0.4622	196	
J	6	Louisville 3	BE	27-9	0.9368	111.6	38	88.2	4	66.8	163	-0.057	299	0.7069	20	106.2	30	98.4	12	0.5114	134	
K	14	Marquette 6	BE	25-10	0.901	113.7	18	93.8	27	68.1	119	-0.027	241	0.6765	39	105.6	45	99.1	36	0.3841	286	
L	2	Memphis 1	CUSA	38-2	0.9661	117.6	6	87.9	2	68.8	99	0.012	140	0.6349	67	105.3	60	100.3	81	0.6014	59	
M	17	Michigan St. 5	B10	27-9	0.8914	113.1	25	94.2	32	64.9	246	0.033	94	0.6946	25	106.5	21	99.1	39	0.526	122	
N	3	North Carolina 1	ACC	36-3	0.9537	120.4	1	92.5	19	74	8	0.05	54	0.7275	3	106	38	97.4	1	0.5402	109	
O	25	Notre Dame 5	BE	25-8	0.864	112.5	31	95.8	46	70.9	40	0.043	72	0.6462	58	105.4	56	100	73	0.3368	316	
P	24	Pittsburgh 4	BE	27-10	0.8705	114.3	12	96.8	64	65.4	223	0.028	102	0.7081	18	105.6	47	97.8	5	0.4677	187	
Q	20	Purdue 6	B10	25-9	0.8783	109.5	52	92.2	13	68.3	112	-0.024	233	0.6367	64	104.1	91	99.1	38	0.4233	248	
R	12	Stanford 3	P10	28-8	0.9053	112.2	34	92.2	12	64.9	245	0.039	79	0.6923	28	106.8	13	99.5	55	0.3414	310	
S	13	Tennessee 2	SEC	31-5	0.901	113.9	15	94	30	72.5	18	0.11	5	0.7084	17	107.4	3	99.4	50	0.6597	29	
T	9	Texas 2	B12	31-7	0.9311	119.9	3	95.6	44	64.8	251	0.046	66	0.7241	5	106.3	27	97.7	3	0.4957	152	
U	4	UCLA 1	P10	35-4	0.9504	115.6	8	89.4	5	65.5	216	0.047	62	0.7028	22	107	7	99.3	46	0.4586	204	
V	62	Vanderbilt 4	SEC	26-8	0.7657	110.1	48	99.4	103	69.6	75	0.11	4	0.6152	87	105.6	46	101.4	139	0.4368	231	
W	11	Washington St. 4	P10	26-9	0.9127	112.3	33	91.5	9	59.5	335	-0.003	178	0.6786	36	106.7	15	100	72	0.3543	305	
X	5	Wisconsin 3	B10	31-5	0.9424	112.4	32	88.1	3	62.1	318	0.043	69	0.6699	44	105.2	64	98.9	29	0.527	120	
Y	18	Xavier 3	A10	30-7	0.8905	115	9	95.8	48	65.2	232	0.054	49	0.655	54	106.2	31	100.4	88	0.5622	82	

FOUR FACTORS

			Offense								Defense											
Letter	Team	Conf	AdjTempo		AdjOE		eFG%		TO%		OR%		FTRate		AdjDE		eFG%		TO%		OR%		FTRate	
1A	American 15	Pat	62	320	106.9	81	52.4	65	21.7	218	32.4	188	41.4	46	105	220	47.8	73	19.2	264	30.3	66	39	216
1B	Arizona 10	P10	65	240	114.2	13	53.9	30	18.5	42	28.5	298	40.4	64	98.1	79	48.7	114	18.5	293	33.1	173	30.4	52
1C	Arkansas 9	SEC	67.9	132	110.4	46	51.9	86	21.7	219	37.9	20	37.9	132	96.7	62	48.4	100	20.7	176	31.9	121	35.6	153
1D	Austin Peay 15	OVC	67.2	154	103	153	51.7	98	18.1	29	30.4	264	44.4	19	103.4	186	54.1	319	24	34	33.3	186	32.6	90

1E	Baylor 11	B12	71.9	22	114.5	11	51.9	89	17	14	32.1	205	35.9	198	100.6	129	48.3	96	19.1	271	32.3	138	39.5	229
1F	Belmont 15	ASun	70.1	56	107.4	73	53.2	43	20.3	135	33.8	130	33.8	243	104.2	202	51.9	257	22	110	31.1	90	35.6	154
1G	Boise St. 14	WAC	72.2	19	106.5	93	57.1	3	20.8	169	31.3	236	39.7	82	103.8	194	50.3	193	19.5	251	29.9	50	33.6	110
A	Butler 7	Horz	61.1	327	113.4	21	54.1	25	16.6	10	30.1	272	36.7	164	95.1	39	48	83	22.7	72	32.2	132	32.6	88
1I	BYU 8	MWC	69.3	81	105.5	112	53.3	42	20.1	116	30.4	261	37.4	142	91.7	11	43.4	5	19.3	258	26.9	3	31	61
1J	Cal St. Fullerton	BW	73.3	13	110	49	54.2	22	18.4	39	33.4	148	32.3	266	103.5	189	52.7	283	23.4	50	31.5	103	32.9	94
B	Clemson 5	ACC	69.2	85	111.5	39	51.9	90	19.8	101	39.4	9	30.6	301	92.5	18	48.1	84	24.3	27	35.5	276	33.8	116
C	Connecticut 4	BE	68.4	110	113.9	16	50.6	139	19.3	71	38.9	17	48.1	4	97.1	69	44.2	8	16.9	332	33.5	207	23.5	5
1K	Coppin St. 16	MEAC	64.1	279	92.9	307	43.5	333	21.9	229	31.7	221	36.6	170	104.8	216	50.4	196	24.4	23	38.6	333	39.9	241
1L	Cornell 14	Ivy	69	91	108.7	61	55.4	9	19.8	97	28.8	290	33.8	244	104.9	219	49.1	131	20.7	178	31.3	98	34.6	135
D	Davidson 10	SC	67.4	146	117.6	5	54.1	27	16.7	11	32.5	181	26.3	332	93.1	21	49.3	141	24	35	29.2	35	37.3	186
E	Drake 5	MVC	64.3	271	119.5	4	52.6	58	18	24	36.7	39	35.2	212	99	99	50.4	197	23.6	43	33.3	188	23.9	6
F	Duke 2	ACC	73	16	113.4	19	53.6	38	18.1	28	33.8	131	40.9	53	91	8	47.6	68	24.5	17	33.8	216	31.9	77
1M	George Mason	CAA	63	299	108	68	52.3	71	18.4	38	32.5	182	39.8	81	100.1	115	47.5	66	18.1	306	27.8	10	27	17
1N	Georgetown 2	BE	62.2	316	113.2	24	56.8	4	21.2	192	33.8	132	34.2	237	90.1	6	42	1	18.9	279	32.8	157	36	163
G	Georgia 14	SEC	65.9	204	102.6	161	47.8	251	21.4	202	37.6	27	31.8	276	96	51	48.1	86	18.8	284	32	129	33.6	111
H	Gonzaga 7	WCC	68.1	120	112.7	28	54.5	19	20.6	155	35.2	82	39.7	85	96.2	53	45.7	21	21	163	30	53	32.1	82
1O	Indiana 8	B10	68	126	112	35	52.3	68	19.8	99	36.1	55	41.9	38	96.3	54	47.3	60	19.3	256	29	28	31	62
I	Kansas 1	B12	67.8	136	120	2	56.6	5	19.1	61	37.8	24	36.4	178	87.1	1	44.3	9	21.9	114	28.8	23	31	64
1P	Kansas St. 11	B12	71.3	31	113.4	20	49.5	180	20.6	159	42.3	2	37.4	143	96	52	48.3	97	22.4	91	30.5	73	38.3	204
1Q	Kent St. 9	MAC	66.6	175	105.5	111	51.9	87	22.3	248	35.5	76	41.2	48	93.5	25	46.5	35	24.5	20	34.9	256	37.9	193
1R	Kentucky 11	SEC	63.6	291	106.4	95	52.7	54	23.2	285	32.1	207	41.1	49	96.9	65	45.1	18	19.2	263	32.6	153	42.1	281
J	Louisville 3	BE	66.8	163	111.6	38	53.1	45	20.2	126	33.5	139	36.5	175	88.2	4	44	7	21.2	155	30.6	79	33.4	105
K	Marquette 6	BE	68.1	119	113.7	18	50.6	141	18.4	37	37.8	23	37.5	138	93.8	27	46.3	30	23.4	49	33.4	197	41	262
L	Memphis 1	CUSA	68.8	99	117.6	6	52.8	53	16.5	8	38.3	19	40.4	65	87.9	2	43.4	6	21.9	119	29.2	36	31.7	73
1S	Miami FL 7	ACC	67.4	144	110.6	43	49.2	189	19	56	36.1	58	39.1	97	96.9	66	47	47	20.3	198	34.2	236	35.4	148
M	Michigan St. 5	B10	64.9	246	113.1	25	52.5	60	20.6	157	39.5	8	33.4	253	94.2	32	46	26	18.3	301	31.5	104	33.2	102
1T	Mississippi St. 8	SEC	68.2	115	106.4	97	52.2	77	21.1	184	34.4	108	39	104	91.6	10	42.5	3	17.5	321	31.9	120	28	27
1U	Mississippi Valle	SWAC	64.7	254	91.6	319	43.4	334	21	177	32.3	191	40.3	68	104.6	211	49.8	166	22.4	87	35.1	262	36.9	178
1V	Mount St. Mary'	NEC	67.9	131	98.6	218	49.8	170	20.8	173	30.2	268	38.7	112	98.9	95	47.2	52	21.3	152	33.3	194	38	198
N	North Carolina 1	ACC	74	8	120.4	1	53	49	18.7	52	42.4	1	38	128	92.5	19	48.2	90	20.7	179	28.7	22	25.7	11
O	Notre Dame 5	BE	70.9	40	112.5	31	52.2	78	18.2	30	35.5	75	34.1	240	95.8	46	46.7	40	17.1	330	30.3	67	23	4
1W	Oklahoma 6	B12	64.5	263	107	80	50.1	159	19.6	86	33.3	150	38.7	111	94.5	35	47	49	19.7	236	30	55	30.3	50
1X	Oral Roberts 13	Sum	65.4	221	102.5	164	49.9	168	19	57	33.7	134	40.6	59	94.1	31	44.8	16	20.4	193	31.8	117	29.6	45
1Y	Oregon 9	P10	67.3	148	117.1	7	55.8	8	18.3	35	31.4	231	36.7	167	102.9	180	50.3	190	16.2	340	30.9	85	34.4	129
P	Pittsburgh 4	BE	65.4	223	114.3	12	50.8	135	18.1	27	39.3	12	36.1	187	96.8	64	47.9	79	20.5	183	33.2	183	28.6	35
1Z	Portland St. 16	BSky	68	123	106.8	84	54.9	11	21.4	207	34.9	92	37.2	150	102.9	179	51	217	22.2	101	31.7	114	34.3	126
Q	Purdue 6	B10	68.3	112	109.5	52	48.9	203	18.5	41	33	165	37.1	156	92.2	13	49.1	127	25.5	8	30.2	63	42.6	288
2A	Saint Joseph's 1	A10	65	243	113.2	23	54.6	17	19.1	58	32.5	183	39.7	84	100.5	125	50.6	205	20.9	170	33.6	209	33.3	103
2B	Saint Mary's 10	WCC	67.5	142	106.1	102	52.5	63	19.3	72	35.7	70	39.3	91	94.4	34	44.6	14	21	167	32.1	131	30.9	56
2C	San Diego 13	WCC	64.6	259	99.9	199	49.2	187	21.9	233	32.8	171	35.6	203	95.9	49	49	125	22.9	64	30.8	81	34	121
2D	Siena 13	MAAC	68.8	97	106.7	87	50.9	128	15.7	5	31.3	235	36.6	172	99	97	51.5	241	24	33	37	311	25.7	10
2E	South Alabama	SB	66.6	173	110.4	45	53.9	29	20.3	133	39	16	46	13	100.6	127	48.4	98	19.9	220	29.4	40	31	60
R	Stanford 3	P10	64.9	245	112.2	34	49.8	169	18.6	46	39.6	7	39.6	86	92.2	12	44.3	11	17.4	324	29.1	33	32.8	93
2F	Temple 12	A10	65.2	237	111	41	54.1	23	18.7	48	28.5	299	35.3	209	99.3	102	49.1	130	19.1	270	32.4	145	31.8	75
S	Tennessee 2	SEC	72.5	18	113.9	15	52.4	67	18.1	26	36.3	51	38	127	94	30	49.1	126	24.5	21	34.8	254	39.6	234
T	Texas 2	B12	64.8	251	119.9	3	51.5	108	14.1	1	36.6	40	32	275	95.6	44	45.7	22	17.8	316	33.8	219	31	63
2G	Texas A&M 9	B12	63.2	296	109.7	51	51.9	88	19.1	59	34.8	95	41.7	41	92.4	17	45	17	17.5	322	28.1	11	26.8	16
U	UCLA 1	P10	65.5	216	115.6	8	52.2	75	18.6	47	39.3	10	37.3	147	89.4	5	46.5	37	21.7	131	27.8	9	25.6	9
2H	UMBC 15	AE	65	242	110.8	42	51.4	110	14.7	2	33	166	33.4	252	107.8	277	50.2	183	19	277	34.8	251	28.6	34
2I	UNLV 8	MWC	65.2	235	109.4	55	48.5	225	16.1	7	30	274	33	257	97	68	46.5	36	22.2	98	32.7	156	32.6	89
2J	USC 6	P10	66.7	166	108.5	62	53.3	41	21.8	224	31.4	233	38.7	113	93.4	24	44.8	15	19.6	245	34.9	256	27.9	24
2K	UT Arlington 16	SInd	69.9	67	100.5	187	52.3	70	24	306	32.7	176	41.4	44	103.2	183	47.4	62	20.4	196	31	86	38.7	210
V	Vanderbilt 4	SEC	69.6	75	110.1	48	54.1	24	19.7	91	31.4	234	38.3	123	99.4	103	49.7	160	20.2	202	33.3	193	32	80
2L	Villanova 12	BE	69.2	84	107.3	75	49.1	196	20.4	142	36	61	38.9	107	94.6	37	51.1	223	23.4	48	31.2	96	46.4	322

W	Washington St.	P10	59.5	335	112.3	33	53.7	36	16.6	9	28.1	305	38.5	118	91.5	9	46.7	43	21.3	149	29.6	42	28.4	33
2M	West Virginia 7	BE	65.2	231	111.7	36	51.4	112	16.1	6	34.6	99	36.6	171	94.5	36	48	80	22.6	76	30.7	80	39.7	237
2N	Western Kentuc	SB	69.9	66	110.5	44	53.5	39	20.1	112	36.8	36	36	193	96.6	59	47.2	54	24.5	18	33.3	191	48.7	329
2O	Winthrop 13	BSth	63.1	297	96.8	250	49.6	179	19.4	78	33.4	144	35.7	200	92.4	16	46.6	39	22.8	68	28.9	26	33.6	113
X	Wisconsin 3	B10	62.1	318	112.4	32	50.6	140	19.1	60	36.1	56	39.9	80	88.1	3	43.4	4	21.4	147	28.7	21	25.4	8
Y	Xavier 3	A10	65.2	232	115	9	54.6	16	19.5	82	35.9	63	42.4	30	95.8	48	47.1	51	19.1	272	30.1	59	31.4	69

Round	# Games Picked Correctly	PPG	Total Points
of 64		2	0
of 32		4	0
Sweet 16		8	0
Elite 8		16	0
FInal 4		32	0
Championship		64	0
	Points Possible		384
	Your Score		0

What you should pick for your 2016 bracket

Student Work - Poor Example

Teams in the elite 8

- North Carolina vs. Notre Dame
- Villanova vs. Kansas
- Oregon vs. Oklahoma
- Virginia vs. Syrcuse
-

Teams that should be in your final four

- The teams that you should put in the final four are North Carolina, Virginia, Villanova and Oklahoma

All of these teams were good in the regular season also because on Kenpom those teams were better than there opponents.

The final teams

- The final teams should be Villanova and North Carolina.They were better than the teams that they faced. Villanova and North Carolina will also be a good match up.

Who should win it all

The team who is going to win it is Villanova. This team is going to when because Kenpom stats show that Villanova is higher than North Carolina.

The data

- Kenpom.com

This data will really help you pick the teams in the billion dollar bracket.

NCAA Bracket Manual

STUDENT WORK EXAMPLE

The Four Factors of Winning

1. Shooting (40%)
2. Turnovers (25%)
3. Rebounding (20%)
4. Free Throws (15%)

The Four Factors of Winning Calculations

Shooting- (FG+0.5*3P)/FGA

Turnovers- TOV/(FGA+.44*FTA+TOV)

Rebounding- ORB/(ORB+Opp DRB)

Free Throws- FT/FGA

Different styles of Stats

There are many types of stats that you can use to make you bracket. You can use Ken-Pom stats, coach polls, player polls, and many other ways. Ken pom is our favorite way to determine who will win. The main stats that Ken Pom uses are the four factors.

Different Stats to Consider

Some stats to consider when deciding who to move on to the next round in your bracket are field goal %, Adj. Offense, Adj. Defense, Adj. Tempo, and others. Some others to consider but not so important are turnovers, offensive and defensive rebounding, and many others. However, sometimes stats are misleading, so be careful.

Rankings of What to Consider

1. Offense and Defensive Efficiency
2. Adj. Offense, Defense, Tempo
3. Turnovers
4. Rebounding
5. Home Court Advantage
6. Luck Advantage

Things to Consider Besides Statistics

Statistics are a big factor in choosing who to advance to the next round, however, there are other things to consider not on the statistical side of choosing who to advance. Examples of these are possibly having more of your fans at the game or if you have home court advantage. Also we think that especially in the round of 64 and 32 there are usually a few upsets.

How to Predict Upsets

There are many ways that you can predict an upset. One way is to look at the higher seeds history in the tournament and if they have gotten upset a lot. Also you look at the how the lower seed has done in earlier tournaments. Just like when Duke was a 2 seed in 2011-12 season and 2013-2014 and they lost to 15 seeds.

Closing

This is what we would do when making the perfect NCAA basketball bracket. Remember, statistics are important but always choose maybe a few upsets especially in the earlier rounds. Thank you for your time!

An Expert Guide On This Years NCAA Bracket

Student Data High conceptual understanding

How To Set Up Your Bracket

Look the team’s history in the tourney

You can look at KenPom stats

You can look at percentage in certian areas

Useful Stats

Of course, the heart, passion, and grit of a team and the fans are statistically impossible to record, other statistics that are valuable to selecting the winners are included in the popular data from Ken Pomeroy as Adjusted Defence, Adjusted Offence, Strength of schedule rating, and believe it or not luck and the overall rankings are included aswell.

Analyzing Past History

There are many aspects of the game basketball including

- Shooting
- Turnovers
- Rebounding
- Free Throws

You can use teams past stats in these categories in the season and in the tournament to predict how they will do.

The Four Factors

First introduced to the basketball world in the book “Basketball On Paper” by Dan Oliver, the four factors of winning are weighted and designed to show the four most vital factors in basketball success that cover about 96 percent of the game and show a very strong correlation with winning.

Effective Field Goal%--40%

Turnover%--25%

Rebounding--20%

Free Throws per Field Goal Attempt--15%

How to Predict Upsets

What exactly defines an upset, upsets are when a lower ranked team beats a higher ranked team and there are often numerous upsets every March which is why sports fans love March Madness. In most cases, upsets are very unpredictable but there is a liable way to predict some...interesting winners in the bracket challenge.

For example a team that killed it in a less competitive conference could’ve gotten a lower or perhaps higher ranking than what represents them as a team. Also, teams that have a rough end or start of a season can also not be ranked to thir full potential.

Coaching

Roy Williams, Rick Pitino, John Calipari, and other legendary coaches and thir valued basketball programs are pressured with high expectations by the student body and the university no matter how little talent they have. For example, Syracuse were ranked 10th last year and played a 7-seeded Dayton pressure was on Jim Bohiem to succeed and succeed he did as the Orange made it to the Final Four, eventually getting eliminated by 1 seeded North Carolina. Expereinced coaches are hard to deny so it would be a good idea to keep that in mind.

VI. Unit Resources

Resource	Location	Use
Ken Pomeroy Statistics	http://kenpom.com/	Ken Pomeroy is one of the foremost basketball statisticians and has been using the four factors to predict NCAA tournament since 2002.
AP Poll	http://collegebasketball.ap.org/poll	The AP poll is a groupthink poll, which takes surveys of large number of individuals, and asks them to rank the basketball teams.
Coaches Poll	http://sportspolls.usatoday.com/ncaa/basketball-men/polls/coaches-poll/	The Coach's Poll asks NCAA basketball coaches to rank the teams and assigns a right based off of the collective results.
Basketball Reference	http://www.basketball-reference.com/about/factors.html	Basketball reference.com is an excellent resource for quickly learning the basics of basketball statistics.
Basketball on Paper	https://www.amazon.com/Basketball-Paper-Rules-Performance-Analysis/dp/1574886886	*Basketball on Paper* is one of the leading books written on basketball statistics. It identifies Four Factors, which are the most important factors in assessing a team's ability.
NBA Miner	http://www.nbaminer.com/	This website is an excellent blog which analyzing basketball statistics teams that this is all the way down to players to six.
Nylon Calculus	http://nyloncalculus.com/	Nylon calculus is an excellent resource for people who love math and basketball and want to use them in conjunction. This website is a leading website for all basketball
NBA Stats	http://stats.nba.com/	the NBA has just made public a huge database of data it has been collecting for numerous years. This database is an incredible resource for students who are trying to delve into new and unique ways of analyzing data.
Basketball Analytics	https://www.amazon.com/Basketball-Analytics-Objective-Strategies-Understanding/dp/1492923176/ref=sr_1_1?ie=UTF8&qid=1470773481&sr=8-1&keywords=basketball+analytics	Basketball analytics is an excellent book by Stephen Shea, which valves in to the statistical implications of why teams win. It fits perfectly with conceptual understanding of this unit, that history informs prediction.

Bibliography

Ability-Grouping Research Reviews: What Do They Say about Grouping and the Gifted? (n.d.). Retrieved August 07, 2016, from http://personalweb.donet.com/~eprice/sdallan.htm

Readiness, Interest, and Learning Profile in Academically Diverse Classrooms: A Review of Literature. Journal for the Education of the Gifted, 27(2-3), 119-145. doi:10.1177/016235320302700203

Tomlinson, C. A., Brighton, C., Hertberg, H., Callahan, C. M., Moon, T. R., Brimijoin, K., . . . Reynolds, T. (2003). Differentiating Instruction in Response to Student

What is VTS? - Method & Curriculum - Visual Thinking Strategies. (n.d.). Retrieved August 09, 2016, from http://www.vtshome.org/what-is-vts/method-curriculum--2

2016 Pomeroy College Basketball Ratings. (n.d.). Retrieved August 09, 2016, from http://kenpom.com/