MONOPOLY AND MORE

Created by: Lauren Miller
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Intended for:
6th-8th grade Math AG/HAG Students




Introduction

Rationale

Skills:

The skills covered in Monopoly and More are predicting the probability of any given event. Students will be able to evaluate and articulate their findings from each simulations. Students will be able to apply their knowledge and skills when playing games that require probability. Also students will reflect and analyze their findings from each simulation. After each simulation students will discuss what probability means and how it relates to patterns.

These skills are very important to know because the students will be tested to use all of the mentioned skills for their performance skills as well as valuable life skills. For example being able to articulate and discuss is a key life skill not only in math but other subject areas such as Language Arts. Also being able analyze will help with science labs and other subject areas.

Content:

The content that will be covered is basic probability terms such as; experiment, trial, outcome, sample space, event, and probability. Along with the vocabulary the students will learn the formula for probability. In this unit students will learn the basic rules for blackjack and yahtzee. Finally students will learn how to use and a KWL chart.

The reason why the content knowledge is important is because without it the students would not understand the basics of probability. The content knowledge that is presented in this unit is the building blocks for more difficult content that will come in later math courses.

Concepts:

The concept covered in this unit is Pattern of Probability. The students will be finding if there is any pattern to probability in each simulation that students will participate in. The reason why this is so important is because students need to realize that patterns are everywhere especially in Math. Probability and patterns have a relationship no doubt go hand in hand, but the students need to explore this on their own.

Differentiation for Gifted Learners

What makes this a great unit for gifted learners is that for one thing it can be taught to students before their seventh grade year. According to Common Core standards probability is not taught till the middle or end of their seventh grade year. Just on that fact alone accelerating their learning is particularly important for gifted learners. Another thing that makes this great unit for gifted learners are allows students to be creative in their performance task. The performance task tests the students knowledge form the whole unit and apply their own creative spin on a board game design. Also this unit is designed to work in small group settings. This will help foster a more cohesive learning environment with the students in that particular group, but also with the teacher. Finally the last reason why this unit is great for gifted learners is that it challenges them to think outside the box. In this unit there are questions that primarily make students to think of real world situations that would not happen in the normal realm of their lives. This will help a lot of gifted learners who sometimes have "out their comments" on any given subject.

GOALS AND OUTCOMES

Content Goals and Outcomes

GOAL 1: To develop a probability model and use it to find probabilities of events, and compare probabilities from a model to understand the frequency.

Students will be able to...

1. Students will be able to learn the definition of probability, and apply to probability-based problems.
2. Describe what the probability formula means in a probability-based problem.
3. Calculate the probability of any given problem.
4. Compare and contrast the between experimental and theoretical probability.

Process Goals And Outcomes

GOAL 2: To predict the probability of each simulation and analyze the patterns of the probability in each simulation.

Students will be able to...

1. Analyze probability give the simulation in real world applications.
2. Articulate their findings from each simulation of real world problems
3. Evaluate the purpose of finding probability in a real world simulation.

Concept Goals And Outcomes

GOAL 3: To understand the concept of probability

Students will be able to...

1. Use appropriate language to define probability, event, and outcome.
2. Predict the outcome of an event of any given situation of a probability-based problem.
3. Apply prior knowledge of probability to help solve real world problems about proability.

Assessment Plan

The summative assessment of this unit is the performance task. The students will have to create a proto type of a probability-based board game with no skill involved. They also have to present their board game in front of their peers and the teacher. This gives the students not only creativity to make the board game but also the accountability to take the assignment serious since they have to present. The performance task is aligned with all three goals. The performance task is aligned with task 1 because you have to come up with your own model/board game based on probability. The performance task is aligned with goal 2 because; when you make the model/board game you have to analyze the probability of winning to make sure it is winnable. Finally the performance task is aligned with goal 3 because; you have to understand probability to build a probability-based board game. Here are some student examples of their probability-based board games.

Assessment Plan

The formative assessments will be a combination of activities (coin flip) during the first two lessons as well as check-ups during the Power Points. The first activity will be the (coin flip) activity. This shows me that the students understand the process of predicting probability and recording data. This is a very important piece of the whole unit. Through out the unit students will predict the probability of any situation then have to record their findings. Another formative assessment is the check ups in the PowerPoint. These are three to four questions to check to make sure the students understand the content that is being presented. Another formative assessment is the simulations themselves. If done correctly the students will demonstrate that they understand probability and have fun playing a game such as blackjack and Yahtzee. Finally I have also given the students a packet to further their knowledge. The packet contains a take home quiz as well as the next lesson of probability if they want an extra challenge.

Lesson Plans

TEACHER NAME	Lesson #
Lauren Miller	1

MODEL	CONTENT AREA	GRADE LEVEL
Simulation Model	**Mathematics - Probability and Statistics**	**6-8th Grade**

CONCEPTUAL LENS	LESSON TOPIC
Pattern of Probability	Probability and Blackjack

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Math
7.SP.C.6 - Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
7.SP.C.7 - Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observe frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.C.8 - Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
ELA
L.7.6 Acquire and use accurately grade-appropriate general academic and domain specific words phrases.
SL.7.2 Analyze the main ideas and supporting details presented in diverse media formats, and explain how ideas clarify a topic, text, or issue under study.

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)*
Patterns determine relationships	How do relationships determine patterns?

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 definition of probability • Students will learn probability formulas • Students will learn the basics guidelines on how to play blackjack • How to calculate the probability of any event • Students will learn how to fill out a KWL chart • Students will learn definition of an event in probability • Students will learn the difference between independent and dependent events in probability.	• Students will be able to predict probability of each hand in blackjack. • Students will analyze probability of getting a "21". • Students will articulate their findings from simulation. • Students will be able to find the probability in any given event. • Students will be able to apply blackjack as a real world application. • Students will evaluate the purpose of probability.

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 is probability? **What items/things relate to probability?** **What can you tell me about probability?** **Is there a personal connection you have to probability?** **What do you want to know about probability?** **What do you want to understand better about probability?**	**What is the definition of probability?** **What is the difference between independent and dependent events?** **What is the probability of drawing (blank) card out of a standard deck?** **What is the probability of pulling out a (blank) card and (different blank) card?** **What is the probability of pulling out (blank) card or (different blank) card?** **What is the probability of getting a 21 in blackjack?** **Explain through your findings what is the best initial hand when playing blackjack?**	What have you learned about probability? What connections did you make while playing blackjack? What inferences can you make about blackjack? In what real-world application can you use probability besides gaming?

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**
Based on the classes' knowledge about probability, I may or may not have to cover the basic information of probability at length, but do a quick review session.	The simulation will be the same, but if I need to I will be the dealer and everyone can be the player. I will have to play with a bigger deck (2 decks 104 cards) OR I could be a dealer with a small group that needs more help and let the more advance group work in a group together.		

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.*

For my hook; I would like to come in wearing some kind of green visor or looking like a casino dealer. I will ask the students to participate in a KWL chart activity. I am going to pose the very basic question, "What is probability?" I will let the students tell me what they know about probability in the K section of the chart. I will ask a few more guiding questions to help further information from the students on the topic of probability such as, "What things are related to probability?"

In the W section of the KWL chart I will pose to the class the question, "What do you want to know about probability?" I want to give the students a chance to answer this question before I give them more questions to access what they are thinking. Another question I would ask is, "What do you want to understand more about probability?"

The reason why I want to do a KWL chart is because depending on the different grades in the class, this will give me a good indication of how much the students know or do not know about probability. I then quickly differentiate my lesson based on the discussion we have from the KWL chart.

(For the purposes of the lesson plan I will be operating as if the students know little information about probability)

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.*

In this part of the lesson will be a two part. I will plan on teaching the basic content of probability in the first half of the lesson using decks of cards. Once we have a good understanding of probability I will then teach the students the basics of blackjack if they do not know already.

In part 1: I will introduce the basic information of probability with a PowerPoint. The information will be the definition of probability, the formula for independent and dependent. I will also ask the students to find the probability of different events. For example, What is the probability of pulling out a 4 in a standard deck? Then once we discuss we will try, "What is the probability of pulling out a 6 and face card of a standard deck of cards Finally, "What is the probability of pulling out a king or a ace in a standard deck of cards." My hope is the students will see the difference between the three questions (single event, and event, or event). Once we have gone over the basics I will give a worksheet to each group (different questions) My task to them will be to solve the question and be able to present to the class. Once each group has presented their question, we will move onto part two of the lesson.

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.*

The second part of the lesson will be the simulation where the students will be playing blackjack (taking turns being the dealer and the players). While this is happening they must keep track of each of their cards and find the probability of getting a total of 21.

I will start off the simulation of an example of how to play blackjack from a YouTube clip. This will give the students a reference of how to play the game. I will also give an instruction sheet to all students who want to read the instruction as well. I will then model how the activity will go:

Choose a dealer
Deal two cards to each player
Then look at cards see if you have a "21" then you decide to hit or fold. (I will explain hitting and folding)
Have the students fill in on the chart I provide which are the two cards and see what would the probability of getting a "21" with one additional hand.
This will continue till they either bust or fold.

The students will do this a few times where everyone that wants a chance to be the dealer can be.

I also want to give the students time to find the probability so if need be, I will allow students to write down the cards they have each round and find the probability afterwards.

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*

Now once students have found the probability of getting a "21" in blackjack. I will let the students discuss which is the best initial hand for blackjack and why. I also want to go through the worst initial hands and have the students explain why those are the worst initial hands. This will let me see if the students are calculating the probability correctly. Then finally go through the good initial hands and explain why.

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

Once the students are finished with our discussion, I want to re-visit the KWL chart. We will review what was said in the K and W sections. Out to the side we will make corrections to previously made statements. This will let them see their misconceptions of probability. Once we have finished that we will move onto the L section of the KWL chart. The L section is what have you learned… My question will be, "What have you learned about probability in today's lesson?" This gives the students to make connections either from the lecture or the simulation model. I would love for both, but I am going to assume it will be more focused on raw information. I plan on asking, "What are some strategies that you have learned in playing blackjack if any?" This way it will let the students use what they have just experienced in the activity and now verbalize it.

Finally, I will ask for an exit ticket question such as, "What real-world applications apply to probability explain you reasoning." (exclude gambling/games in answer)

This will have them synthesize the raw information that they have learned and apply to other areas of practice.

TEACHER NAME			Lesson #
Lauren Miller			2
MODEL	**CONTENT AREA**	**GRADE LEVEL**	
Simulation	**Mathematics - Probability and Statistics**	**6th – 8th grade**	
CONCEPTUAL LENS		**LESSON TOPIC**	
Pattern of Probability		**Probability with Dice (Bunko and Yahtzee)**	

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Math

7.SP.C.6 - Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.

7.SP.C.7 - Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observe frequencies; if the agreement is not good, explain possible sources of the discrepancy.

7.SP.C.8 - Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

ELA

L.7.6 Acquire and use accurately grade-appropriate general academic and domain specific words phrases.

SL.7.2 Analyze the main ideas and supporting details presented in diverse media formats, and explain how ideas clarify a topic, text, or issue under study.

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)*
Patterns determine relationships.	**How do relationships determine patterns?**

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?)
• Vocab ulary: • Experiment – is an activity in which results are observed • Trial – Each observation is called a trial • Outcome- Each result of observation is called an outcome • Sample Space – is the set of all possible outcomes of an experiment • Event – is any set of one or more outcomes • Probability – of an event is a number 0 or (0%) to 1 (or 100) that tells you how likely the event will happen. • Students will learn the probability formula • Students will learn the rules of Bunko or Yahtzee • Students will learn how to play Bunko or	• Students will be able to describe the diffrence between theoretical probability and experimental probability • Students will be able to predict probability during each game of Bunko • Students will be able to predict the probabilitity during each game of Yahtzee • Students will be able to activily play Bunko/Yahtzee • Students will be able to record data from each game • Students will analyze data from game • Students will reflect data from each game • Students will discuss data from each game • Studenys will reflect from yesterday's lesson • Students will analyze patterns from Bunko simulation

Yahtzee • Students will learn the differnce between experimental and theoretical probability	• Students will analyze patterns from Yahtzee simulation

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 is the definition of Probability? What did you learn about probability yesterday? How can we apply probability to other content besides math? What is the probability formula? What did you learn yesterday playing blackjack? What patterns did you notice yesterday while playing blackjack? Is there a relation between the probability of playing blackjack and the patterns you noticed while playing blackjack? What id the probability of rolling a 6 on a standard die?	Who know how to play Yahtzee? Who know how to play Bunko? What are the rules of Yahtzee? What are the rules of Bunko? What other games do you know that involve dice? What can you infer that we are doing today?	How does probability relate to Yahtzee? How does probability relate to Bunko? Did you find any patterns while playing Bunko, explain your answer. Did you find any patterns while playing Yahtzee, explain your answer. What were some challenges while playing Bunko, and why? What were some challenges while playing Yahtzee, and why? What are some similarities from yesterday and today's simulation? What are some differnces from yesterday's and today's simulation?

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
	I will let the students who need more help with probability based on yesterday's activity and discussion before simulation play Yhtzee with me. The more advance students will play Bunko during simulation. The basis for the advance students will be on how the students did yesterday and during discussion before simulation.	**Students will be working on performance task today. The product of their work can vary depending on how creative nad techy each student wants to be.**	

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.*

For my hook; I would like to come in wearing the same casino dealer outfit, but instead of having cards I will have dice. I want to have at least four kinds of dice; regular dice, 20-sided dice, 16-sided dice, and 10-sided dice. I would then ask the students, "What is the probability of rolling a 6 on a standard dice?" I would go through a few of these types of questions with each type of dice. Then I want to pose the question, "What can you infer we are talking about today?"

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.*

Then I would review yesterday's activity, by asking questions like, "What did we learn about probability yesterday?" "What patterns did you notice yesterday?" "Can you make any relationships between the patterns and your data from yesterday?" I plan on spending about 10-15 min discussing the findings of yesterday's simulation. I then would like to re-visit the PowerPoint over probability to once again reinforce the basic vocabulary of probability such as; probability, event, trial, outcome, sample space, experimental probability, theoretical probability. This should take about 20 min. We will do some reinforcement activities such as finding the probability when using spinners and dice.

The activity is built into the PowerPoint and should not take more than 10 min total.

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.*

This part of the lesson, we will transition into the simulation, I will explain the rules of Bunko and Yahtzee. Each student will get a handout with rules for each game. Students will also receive a data sheet, to help collect data or probability during each round/game.

I will let the students know they will be split into two groups 1 group will be playing Yahtzee with me and the other group will be playing Bunko. The students who need more help with probability will be with play Yahtzee the easier of the two dice games. We will be playing 6 rounds total of Yahtzee. Each round the player must calculate the probability of rolling 3 3's or 4 4's depending on what they are trying to get.

The other group will be playing Bunko with limited help from me. This group will be my more advanced group in terms of probability skills. The Bunko game will be played in 6 rounds as well. The students will also collect data and must find the probability of rolling as many 1's or 2's, etc. for their partner.

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*

Once the students all have played 6 rounds of either game, I will let each player go back and check their work/calculate the probability for each round if they did not have time during the game. This will most likely take about 20 min. After all the students have worked on their data sheets, I would like to discuss their findings.

Some things we are going to discuss are; Similarities from yesterday's simulation and todays. We will discuss the patterns from yesterday and today's patterns. We will be filling out a vin diagram to compare yesterday and today's simulation.

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

I will be evaluating student's simulation from their data and discussion. I will be looking for if they calculated the probability correctly. I will also be looking for if they participated in the discussion. Some things specifically looking/listening during discussion will be if they can analyze patterns of probability. If students can participate orally and verbalize their findings during simulation.

I will also introduce the performance task and go over rubric for performance task.

TEACHER NAME			Lesson #
Lauren Miller			3
MODEL	**CONTENT AREA**	**GRADE LEVEL**	
	Mathematics – Probability and Statistics	**6th -8th grade**	
CONCEPTUAL LENS		**LESSON TOPIC**	
Pattern of Probability		**Proability with Board Games**	

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Math
7.SP.C.6 - Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
7.SP.C.7 - Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observe frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.C.8 - Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
ELA
L.7.6 Acquire and use accurately grade-appropriate general academic and domain specific words phrases.
SL.7.2 Analyze the main ideas and supporting details presented in diverse media formats, and explain how ideas clarify a topic, text, or issue under study.

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)*
Patterns determine relationships	**How do relationships determine pattern?**

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?)
• Vocabulary: • Experiment – is an activity in which results are observed • Trial – Each observation is called a trial • Outcome- Each result of observation is called an outcome • Sample Space – is the set of all possible outcomes of an experiment • Event – is any set of one or more outcomes • Probability – of an event is a number 0 or (0%) to 1 (or 100) that tells you how likely the event will happen. • Students will learn the probability formula	• Students will be able to describe the diffrence between theoretical probability and experimental probability • Students will be able to record data from each game • Students will analyze data from game • Students will reflect data from each game • Students will discuss data from each game • Studenys will reflect from yesterday's lesson

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 is the definition of Probability? What did you learn about probability yesterday? How can we apply probability to other content besides math? What is the probability formula? What is the probability of rolling a 6 on a standard die?	What is the object of the game when playing Life? What is the object of the game when playing Monopoly? What elements of Life or Monopoly have probability in it?	**How does probability relate to the game of Life?** **How does probability relate to the game of Monopoly?** **Did you find any patterns when playing Life, explain your answer.** **Did you find any patterns playing Monopoly, explain your answer.**

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 be working on performance task today. The product of their work can vary depending on how creative nad techy each student wants to be.	

TEACHER NAME	Lesson #
Lauren Miller	**4**

MODEL	CONTENT AREA	GRADE LEVEL
	Mathematics - Probability and Statistics	**6th – 8th grade**

CONCEPTUAL LENS	LESSON TOPIC
Pattern of Probability	**Probability**

LEARNING OBJECTIVES *(from State/Local Curriculum)*

Math
7.SP.C.6 - Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability.
7.SP.C.7 - Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observe frequencies; if the agreement is not good, explain possible sources of the discrepancy.
7.SP.C.8 - Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
ELA
L.7.6 Acquire and use accurately grade-appropriate general academic and domain specific words phrases.
SL.7.2 Analyze the main ideas and supporting details presented in diverse media formats, and explain how ideas clarify a topic, text, or issue under study.

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)*
Patterns determine relationships.	**How do relationships determine patterns?**
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?)**
• Vocabulary: • Experiment – is an activity in which results are observed • Trial – Each observation is called a trial • Outcome- Each result of observation is called an outcome • Sample Space – is the set of all possible outcomes of an experiment • Event – is any set of one or more outcomes • Probability – of an event is a number 0 or (0%) to 1 (or 100) that tells you how likely the event will happen.	• Students will be able to describe the diffrence between theoretical probability and experimental probability • Students will analyze data from game • Students will reflect data from each game • Students will discuss data from each game • Students will be able to present presentations • Students will be able to articulte their presentations • Students will be able to demostrate the understanding of the task • Students will be able to evaluate their work

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 is the definition of Probability? How can we apply probability to other content besides math? What is the probability formula?	What are you presenting today? How does your game work? What is the object of your gme? What is your game called? What is the inspiration for your game? Do you think your game is fun?	What did you learn from this weeks classes? What did you like and dislike from this weeks classes? What would you change about this weeks classes? How will you use probability in the future?

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 be working on performance task today. The product of their work can vary depending on how creative nad techy each student wants to be. **Also students will be presenting their performance task today. Their presentation can be in any form as long as it fits in the guideline of the performance task.**	

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.*

Todays there will not be much of a hook, because I want the students to focus on finishing their performance task and getting ready to present.

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.*

I want the students to take the first hour finishing their performance task/game idea. I will have a count down clock projected so the students can visually see how much they have. I was thinking the first hour would be enough.

After that I want to the students to do a quick practice run with a partner or a group of three. I want them to get the "bugs out" before they present.

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.*

Finally students will come one by one to the front of the room and present their project. This should take about 5-10 per student. Once all the students are finished I want each of them to grade themselves on how they did.

What grade would you give yourself?
What would you change if you had more time to work on project?
Would you change about this project?
What did you learn?
Did you have fun, if not what would you do to make it more interesting?

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*

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

After students are done evaluating themselves I want them to evaluate the course. (Questions from Post Lesson Questions)

Unit Resources

Links for videos:

Basics rules for Blackjack, have students watch the video and pause and ask for questions. I find that it is helpful to watch more than once with students. Also have students read the cheat sheet at the same time.
http://casinogambling.about.com/od/blackjack/a/Blackjack101.htm

This video is for tips on how to play blackjack. This is an added clip if you need to adjust for time this clip is not the most important to the lesson.
https://www.youtube.com/watch?v=F07Swzj9DDo

This clip is about counting cards it will be the hook for my lesson. It is a clip from the movie 21. The movie is rated PG-13 please preview to make sure it is appropriate for your students.
https://www.youtube.com/watch?v=cgg9sblRFVM

This clip is the whole 21 movie trailer, be sure to ask if all students are 13 or above or stop at about 1:55… The clip can get a little racy so please preview before showing to students.
https://www.youtube.com/watch?v=PsK1c9ZBpuw

Student Handouts:

Probability Notes Lesson 1: Name: _____

- _____ is a measure of how likely an event is to occur.
- Probabilities are written as:

  _____

  - _____

    _____
  - _____

    _____
- If an event is certain to happen, then the probability of that event is

  _____

  _____
- If an event will _____ happen, then the probability of the event is 0 or 0%.
- If an event is just as likely to happen as to not happen, then the probability of the event is ½ 0.5, or 50%.
- Copy Chart from Slide 5 below

- The probability of an event is written:

  _____

  _____

  _____

- An _____ is a possible result of a probability experiment.
- An **event** is a

  _____

  _____

  _____

- Try These:

1. What is the probability that the spinner will stop on part A?
2. What is the probability that the spinner will stop on
   a. An even number?
   b. An odd number?
3. What is the probability that the spinner will stop in the are marked A?

Try These:

1. What is the probability of spinning a number greater than 1?
2. What is the probability that a spinner with five congruent sections numbered 1-5 will stop on an even number?
3. What is the probability of rolling a multiple of 2 with one toss of a number cube?

Student Handout 2: Coin Toss

	A	B
	Heads	Tails
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

Name:_____
Date:_____

Notes:

Student Handout 3: Black Jack Cheat Sheet

Here are some guidelines for how to play your blackjack hand:

You have...	Dealer shows...	You should...
8 or less	Doesn't matter	Always hit
9	3,4,5, or 6 2 or 7 and up	Double down Hit
10	2 through 9 10 or Ace	Double down Hit
11	2 through 10 Ace	Double down Hit
12	2, 3, or 7 and up 4 through 6	Hit Stand
13 to 16	7 and above 2 through 6	Hit Stand
17 to 21	Doesn't matter	Always stand

An ace can make things a bit more complicated. Here's what to do if one or both of your cards is an ace:

You have an ace and...	Dealer shows...	You should...
Another ace	Doesn't matter	Always split
2 or 3	5 or 6 Anything else	Double down Hit
4 or 5	4, 5, or 6 Anything else	Double down Hit
6	3 through 6 Anything else	Double down Hit
7	3 through 6 2, 7, or 8 9 and up	Double down Stand Hit
8 or 9	Doesn't matter	Stand
10 and up	Doesn't matter	Stand (You have blackjack!)

Another tricky situation occurs when you are dealt two of the same card initially. The chart below shows what to do in that instance:

You have a pair of...	Dealer shows...	You should...
2s or 3s	4, 5, 6, or 7 Anything else	Split Hit
4s	Doesn't matter	Never split
5s	2 through 9 10 and up	Never split; double down Never split; hit
6s	3, 4, 5, or 6 Anything else	Split Hit
7s	2 through 7 8 and up	Split Hit
8s	Doesn't matter	Always split
9s	2 through 6 7 8 or 9 10 and up	Split Stand Split Stand
10s, jacks, queens, or kings	Doesn't matter	Never split; stand

Student Handout 4: Blackjack Rules:

Objective	To beat the dealer by having a higher card total without going over 21
Card Values	2 to 10 = Face Value J, Q, K = 10 Ace = 1 or 11 **Note: The card suits are irrelevant in Blackjack.**
Definitions	Blackjack = an Ace and a card worth 10 points (21 total) Hole = the dealer's card that is face down Hit = draw another card Stand = take no more cards Bust = going over 21
How to Play	- Players place bets by putting the desired number of chips in the circle in front of their seat. - The dealer deals two cards face up to each player. The dealer receives one card face up and one face down. - The dealer asks each player, in turn, whether they want to hit or stand. - Base your decision on the assumption that the dealer has a card worth 10 points in the hole. - Indicate that you want a hit by tapping the table or making a motion to beckon another card (as if motioning someone to "come on back"). Continue until you desire no more cards. **Note: Most casinos do not allow you to touch the cards.** - If you don't want a hit (or are finished hitting), indicate so by waving your hand back and forth face down over your cards. - Once all players have made their decisions, the dealer reveals his hole card and hits or stands as appropriate. - Payouts are issued based on the outcome.
Winning	If your total is higher than the dealer's (or if the dealer busts), you win.
Payouts	- If you get Blackjack, the dealer pays you 3 to 2. - If you and the dealer both get Blackjack, it is a push and no chips are given or taken away. - If you have a higher total than the dealer (or the dealer busts), the dealer matches the amount of your chips. - If you have a lower total than the dealer (or you bust), the dealer takes your chips.
Doubling Down	You are allowed to double your bet after receiving your first two cards. You do this by placing the additional chips next to your original bet. If you decide to do this, you receive only one additional card.
Splitting	If you receive two cards of the same number, you can split them into two separate hands. Do this by placing another equal bet alongside your first bet. The dealer will separate your cards and give you an additional card to make each one a complete hand by itself. You will then play each hand separately as you normally would.

Insurance	If the dealer's face up card is an ace, he will offer players the option of buying insurance. If you choose to do so you can then wager half your original bet (in addition to it) that the dealer does have Blackjack. If he does, your insurance is paid 2 to 1 but your original bet is lost (meaning you break even for the hand). If he does not have Blackjack, you lose your insurance.
Even Money	If you have Blackjack and the dealer has an ace showing, the dealer will offer you even money for your Blackjack (instead of 3 to 2). If you do not take it and the dealer also has Blackjack, you will have a push just like normal.

Website Links:

www.hasbro.com/common/instruct/**yahtzee**.pdf - This is the PDF of the Yahtzee rules. Print out if needed for students who do not know how to play Yahtzee.

www.tidyform.com/**yahtzee-score-sheet**s.html - Yahtzee scorecards. This link is to print out the score ccards for your students when playing yahtzee.