

Topic/Theme: Probability and Plinko Casino Game

Class/Year Group: Year 10 / Year 11

Subject(s): Mathematics - Probability

Outline

<p>What is the challenge your students will tackle?</p> <p>Using a cork board, thumb tacks, a template and marbles, can you build an accurate Plinko (Galton) Board? Use your board to design a game (rules and scoring system) for a casino. Resources available here.</p>	<p>Why is this meaningful to the students - what's the hook?</p> <p>Situating the activity in a context that the students are aware of should encourage engagement. The idea of a game is appealing.</p>	<p>What are the key ideas that the students will remember?</p> <p>Pascal's Triangle, basic rules of probability.</p> <p>Gambling is not a good idea!!</p>
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Learning Objectives

<p>What curriculum content will be addressed?</p> <p>This activity reinforces students' ability to identify pattern, in particular, Pascal's Triangle. The basic rules of probability will be addressed, with the opportunity to explore AND/OR rules, depending on the abilities of the students.</p> <p>By the end of this activity students <i>will be able to</i>:</p> <ul style="list-style-type: none"> Identify Pascal's triangle determine simple probabilities use some rules of probability tabulate data in a spreadsheet create a histogram using a spreadsheet 	<p>How are four key 21st Century Skills addressed?</p> <p>Creativity Divergent thinking in brainstorming activity, construction of suitable rules and scoring system, appropriate decoration of board.</p> <p>Communication Team members will need to communicate with each other throughout the activity, and will need to communicate their results during the final presentation.</p> <p>Collaboration Students will need to work together in order to accomplish the task in the given time.</p> <p>Critical Thinking Finding solutions, discussing rules and scoring options.</p>
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Reflection

<p>How will you know that they are learning?</p> <p>Through observation of student activity, discussions with the groups and team leaders, and analysis of their results and finished presentations.</p>	<p>In what ways will students reflect on progress?</p> <p>Students will engage with their peers and teacher throughout the activity, allowing them to reflect on their progress. When they present their results at the end of the activity, they will receive feedback on their progress. Assessment rubrics and feedback forms can be used to provide further summative and formative assessment for the students.</p>
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Possible Aspects	Description	Time
	Set up: Icebreakers and team formation if required.	10 mins
	Warm up: Brainstorm - what different forms of gambling are common in everyday life?	5 mins
	Investigate: Present the challenge - Using a cork board, thumb tacks, a template and marbles, you are going to build a Plinko (Galton) Board. Use your board and the exploration questions , to design a game (rules and scoring system) for a casino, in such a way that it is attractive to “punters”, but that “the house” always wins.	10 mins
	Plan: Teams discuss how they are going to approach the questions, devise a schedule, and assign tasks and roles.	10 mins
	Create: Teams construct their Plinko boards and set about answering the exploration questions using video, internet and spreadsheets.	60 - 90 mins
	Create: Teams use their knowledge of probability to devise rules and a scoring system for their casino game.	25 mins
	Create: Teams decorate their Plinko boards using mathematical themes.	10 - 30 mins
	Present: The teams are required to pitch their game to the facilitators, and to convince them of the mathematical soundness of the rules. The game should be attractive to potential players, “casino owners”, and at an aesthetic level.	30 mins
	Reflect: Discussion should relate to the process, but also to the concepts of probability and the dangers of gambling.	15 mins
	Reflect: If possible, play the games!	25 mins