08 / STUDENT ACTIVITY

Which dice total should you choose?

Suggested MYP Years 2-4 | 40 minutes | Sample spaces

Name: _____ Class: _____ Date: _____

Inquiry question

If you win when two dice add to your chosen total, is every total equally good?

Two independent fair six-sided dice are rolled. You choose one integer total from 2 to 12 before rolling and score one point whenever that total occurs. All successful totals pay the same reward.

You need: Two fair six-sided dice; paper

1. Choose a total and justify your initial strategy.

2. Run 30 trials with a partner and compare frequencies. Keep a tally of every total.

3. Construct a complete sample space that distinguishes the first die from the second.

4. Recommend a total using theoretical probability, then explain why your short experiment may show a different winner.

Record your investigation

Use the space below and extra paper for diagrams, tables, calculations and your conclusion.

Exit response: What did you revise, and what evidence changed your mind?

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Teaching purpose

Comparing simulation with an explicit sample space makes the source of probability claims visible.

Expected findings / checked solution

There are 36 equally likely ordered outcomes. Counts for sums 2 through 12 are 1, 2, 3, 4, 5, 6, 5, 4, 3, 2, 1. Total 7 has probability 6/36 = 1/6 and maximises expected points. The expected number of sevens in 30 trials is 5; it is not a guaranteed count. Totals are not equally likely even though individual ordered die outcomes are.

Neutral teacher prompt

What are the equally likely outcomes: totals, individual faces, or ordered pairs?

Support

Provide an empty 6 by 6 grid with die values as row and column headings.

Extension

Choose rewards that give equal expected points for totals 2 and 7; compare risk as well as expectation.

Suggested lesson rhythm

Launch for 5 minutes; explore for 25 minutes; compare approaches for 7 minutes; finish with a 3-minute exit response.

Formative evidence

Look for chosen methods, defined variables, independent checks and explanations. These are teaching activities, not IB-issued assessments or automatic criterion scores. Use current school assessment guidance for summative work.

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