03 / STUDENT ACTIVITY

Can a spinner game be fair?

Suggested MYP Years 1-3 | 40 minutes | Probability

Name: _____ Class: _____ Date: _____

Inquiry question

Can you redesign a spinner so neither player has an advantage?

A spinner has eight equally likely sectors: five blue and three gold. Blue awards Player A one point; gold awards Player B one point. Each spin is independent. You may simulate by drawing one of eight labelled slips and replacing it each time.

You need: Paper; pencil; optional spinner

1. Predict the scores after 80 spins and explain the assumptions.

2. Run 40 trials and record both frequencies. Compare the results with your prediction.

3. Redesign the sector colours to make equal one-point rewards fair.

4. Keep five blue and three gold sectors. Can you change the points per colour so expected scores are equal?

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

Students distinguish observed results from a probability model and discover that fairness needs a precise definition.

Expected findings / checked solution

Expected scores after 80 spins are 50 for A and 30 for B, not guaranteed outcomes. With one point per win, four sectors of each colour is fair. With the original sectors, award A 3 points per blue and B 5 per gold: both expected scores per spin are 15/8. Experimental differences alone do not establish unfairness.

Neutral teacher prompt

Do you mean equal chances of scoring, equal expected points, or equal chances of winning a whole match?

Support

List all eight equally likely outcomes and begin with the colour redesign.

Extension

Explain why equal expected points need not give equal probabilities of winning a fixed-length match.

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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