

Is this die fair?

NAME _____ GROUP _____

THE MYSTERY PAIR

One of these two dice is fair. The other is weighted, so one face comes up more often than it should. Nothing on the screen tells you which.

You get 20 rolls each. That is all.

Part A · Twenty rolls each

Write in the counts from the simulator.

DIE A

face 1	face 2	face 3	face 4	face 5	face 6

DIE B

face 1	face 2	face 3	face 4	face 5	face 6

On this evidence, which die do you think is weighted?

☐ DIE A

☐ DIE B

☐ CANNOT TELL YET

WORTH KNOWING BEFORE YOU DECIDE

A fair die rolled 20 times gives six or more 6s about 1 time in 10.

It gives no 6s at all about 1 time in 40.

Both of those look surprising. Neither of them proves anything.

Is this die fair?

Part B · Design a test that would settle it

Write all three BEFORE you roll anything else.

Here is what a FAIR die should give you. Use it to compare.

ROLLS	EACH FACE SHOULD COME UP ABOUT	WEIGHTED FACE WOULD BE ABOUT
20	3 times	8 times
60	10 times	22 times
200	33 times	75 times

1. How many rolls will you use?

2. Why that many? What made you choose that number?

3. What result would convince you? Write it down BEFORE you roll.

AFTER YOU RUN IT

Now run your test. Then finish this sentence:

I think die _____ is the weighted one, because _____

Part C · Show your thinking

SF

1. A fair six-sided die is rolled 60 times.

How many 4s would you expect? Show your working.

CF

2. Two dice were each rolled 30 times. Die A showed a six 5 times.

Die B showed a six 11 times. Which is more likely to be weighted?

WORKING SPACE

Is this die fair?

Exit ticket

Hand this in at the end of the lesson.

KAI'S SPINNER

Kai has a spinner with 4 equal sections. One section is red.

Kai spun it 16 times and it landed on red 6 times. Kai says the spinner is rigged.

1. How many reds would you expect in 16 spins?

2. Is Kai right that the spinner is rigged? Explain.

3. What would you do to find out for sure? Say how many spins and why.