

What might the deck be?

NAMES _____

CLASS _____

THE PROBLEM

Every card in a deck is either a picture card or a numbered card.
If you draw one card without looking:
 the probability of a PICTURE CARD is $\frac{1}{4}$
 the probability of an EVEN NUMBER is $\frac{1}{2}$
What might the deck be? Nobody will tell you how many cards there are.

Part A · My first deck

Work on your own for the first five minutes.

PICTURE CARDS	EVEN CARDS	ODD CARDS	TOTAL	DOES IT WORK?

Part B · Test it

Draw a card, record it, then PUT IT BACK. Twenty times.

TICK IF IT WAS A PICTURE CARD

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20

I drew a picture card _____ times out of 20.

WORKING SPACE — SKETCH YOUR DECK HERE

What might the deck be?

Part C · More than one answer

Find other decks that also work. Fill in a row for each one.

PICTURE CARDS	EVEN CARDS	ODD CARDS	TOTAL	DOES IT WORK?

Check BOTH probabilities before you write "yes".

Part D · Show your thinking

CF

1. Nobody told you about the odd-numbered cards.

What is the probability of drawing an odd-numbered card? How do you know?

CF

2. Two students both made decks that work. One used 8 cards, the other used 20.

Are they both right? How do you know?

CU

3. Look at every deck that works. Why is the total always a multiple of 4?

GOING FURTHER

a. A deck has exactly 20 cards. How many of each kind? Is there more than one answer?

b. If 60 Prep students each drew one card and put it back, how many picture cards would you expect?

c. A DIFFERENT deck has $P(\text{picture}) = \frac{1}{3}$ and $P(\text{even}) = \frac{1}{2}$. Which deck sizes work now? What is $P(\text{odd})$ for that deck?

What might the deck be?

Exit ticket

Hand this in at the end of the lesson.

A bag of counters has a $\frac{1}{5}$ chance of drawing a RED counter.

1. Give two DIFFERENT bags that would work.

They must have different numbers of counters altogether.

BAG 1

BAG 2

2. Could the bag hold 8 counters? Explain your answer.

3. In one of your bags, what is the probability of drawing a counter that is NOT red?