

Luna's Space Adventure

Grade 5 · Outcomes and probability · 5.PS.3

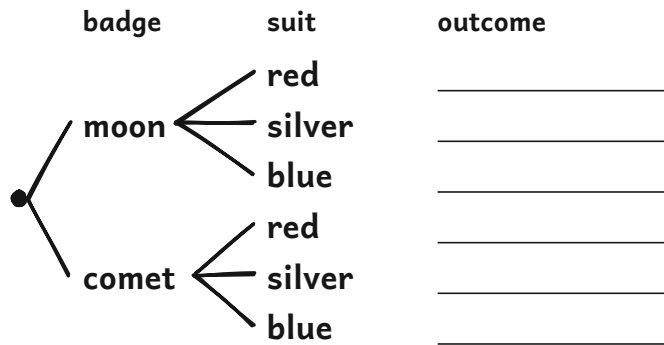
Name _____

Date _____



Astronaut Luna is exploring a far-off corner of space. Solve each problem to help Luna's mission go smoothly!

Tree diagram Orion picks a badge and a suit, any one equally likely. Write every outcome.



How many outcomes? _____

Probability of comet and red? _____

Probability the suit is red? _____

Every outcome Toss a coin (H or T) and roll a number cube. Write every outcome, like H1.

	1	2	3	4	5	6
H						
T						

How many outcomes? _____

Probability of H and an even number? _____

Probability of a 1 or a 2? _____

Multiply to count Choices for each pick, multiplied, give every way.

- ① Nova picks a suit (red, silver or blue) and a helmet (pointy or square). How many different ways can Nova choose?

.....

_____ ways

- ② Orion picks a badge (planet, moon, star or comet), a helmet (square, pointy or round) and a suit (blue, white, red or silver). How many different ways can Orion choose?

.....

_____ ways

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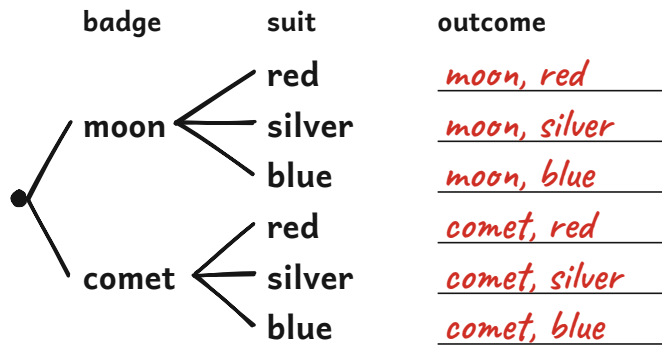
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ANSWER KEY



Astronaut Luna is exploring a far-off corner of space. Solve each problem to help Luna's mission go smoothly!

Tree diagram Orion picks a badge and a suit, any one equally likely. Write every outcome.



How many outcomes? 6

Probability of comet and red? $\frac{1}{6}$

Probability the suit is red? $\frac{2}{6} = \frac{1}{3}$

Every outcome Toss a coin (H or T) and roll a number cube. Write every outcome, like H1.

	1	2	3	4	5	6
H	<u>H1</u>	<u>H2</u>	<u>H3</u>	<u>H4</u>	<u>H5</u>	<u>H6</u>
T	<u>T1</u>	<u>T2</u>	<u>T3</u>	<u>T4</u>	<u>T5</u>	<u>T6</u>

How many outcomes? 12

Probability of H and an even number? $\frac{3}{12} = \frac{1}{4}$

Probability of a 1 or a 2? $\frac{4}{12} = \frac{1}{3}$

Multiply to count Choices for each pick, multiplied, give every way.

- ① Nova picks a suit (red, silver or blue) and a helmet (pointy or square). How many different ways can Nova choose?

$3 \times 2 = 6$

6 ways

- ② Orion picks a badge (planet, moon, star or comet), a helmet (square, pointy or round) and a suit (blue, white, red or silver). How many different ways can Orion choose?

$4 \times 3 \times 4 = 48$

48 ways

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GUIDE

① What this sheet practises

Listing every outcome with a tree diagram or a table, counting them by multiplying, and finding a probability.

② A problem from the sheet, worked out

Tree diagram Orion picks a badge and a suit, any one equally likely. Write every outcome.

badge	suit	outcome	How many outcomes?	<u>6</u>
moon	red	<u>moon, red</u>	Probability of comet and red?	<u>1/6</u>
	silver	<u>moon, silver</u>	Probability the suit is red?	<u>2/6 = 1/3</u>
	blue	<u>moon, blue</u>		
comet	red	<u>comet, red</u>		
	silver	<u>comet, silver</u>		
	blue	<u>comet, blue</u>		

How: Branch each first choice into every second choice. Multiply to count: 3 suits $\times$ 3 badges = 9. Probability is matching outcomes over all outcomes: $1/9$.

③ Words to know

outcome one possible result

tree diagram branches that show every outcome

probability matching outcomes out of all outcomes

④ Watch for

- Adding the choices ($3 + 3$) instead of multiplying them (3×3).
- Leaving out an outcome by missing a branch or a table cell.

⑤ Where it fits

THIS SHEET

5.PS.3

List all outcomes with a tree diagram or table, count them by multiplying, and find a probability.

⑥ Helping at home

Lay out 2 shirts and 3 pairs of pants and list every outfit together. Check the count with $2 \times 3 = 6$.