

Three scoops of ice cream please – Possible and impossible

This activity helps children to develop an understanding of possible, impossible, likely and unlikely.

It works well if introduced as a whole class lesson. It is suitable for a follow-up activity in maths groups.

It could be introduced using the dice and then re-done using the spinners. Will the results be the same?

Print and construct enough *red – blue – yellow dice* or *spinners* for children to have easy access, for example one for each pair or group of three or four.

Each child needs:

- A copy of the “Three scoops of ice cream” sheet
- 3 coloured pencils – red, blue and yellow
- Easy access to a dice or spinner

Introduction

Distribute the worksheets to the children.

Explain that they will roll the dice (or spin the spinner) to determine what flavours of ice cream they’ll add to their cone. The first roll will determine the flavour for scoop 1, the second for scoop 2 and the third for scoop 3.

Show the children the dice. Explain that red is strawberry, yellow is mango and blue is blueberry.

Examples of questions for discussion:

- What flavours of ice cream could you have in your cone?
- Could you have a strawberry scoop?
- Could you have a vanilla scoop?
- Will everyone have the same flavours?
- Will everyone roll the same flavour first?
- Could you have an ice cream with just two different flavours?
- Could you have an ice cream with three different flavours?
- Could you have an ice cream with just one flavour?

Ask children to predict what flavours they think they will roll.

Scoop 1

Tell the children to take turns to roll the dice to find out how to colour the first scoop.

When all have coloured the first scoop ask:

- Who has strawberry?
- Who has mango?
- Who has blueberry?
- Who has vanilla?
- Does anyone have chocolate? Why not?

Ask the children with strawberry to stand together, the children with mango to stand together, and the children with blueberry to stand together. Do a quick calculation and comparison of the number in each group.

Ask:

- Is it possible to get the same flavour for your second scoop?
- Are you more likely to get the same flavour or a different flavour for your second scoop? Why or why not?
- Is it possible to get a vanilla or a chocolate this time?
- What flavour do you think you will get next time?

Ask the children to return to their groups.

Scoop 2

Tell the children to take turns to roll the dice to find out how to colour the second scoop.

When all have coloured the second scoop ask:

- Who rolled the flavour they expected?
- Who has two scoops of the same flavour?
- Who has two different flavoured scoops?
- Is it possible that others will have the same flavours as you? How likely is it?
- Is it possible that no one else will have the same ice cream as you? How likely is it?

Ask the children to move around the class to find others, if any, with ice creams coloured the same as theirs. When they have found all with the same, they should stand together. Ask children to tell the flavours of their ice creams. Do a quick calculation and comparison of the number in each group.

Invite children to comment and ask their own questions.

Ask questions similar to those asked previously, for example:

- Is it possible to get the same flavour as one of your previous scoops on your third scoop?

- Are you more likely to get a similar or a different flavour for your third scoop? Why or why not?
- If you have two scoops the same, how likely is it that you will get a third scoop the same?
- If you have two different scoops, how likely is it that you will get a third different scoop?
- Is it possible to get a vanilla or a chocolate this time?
- What flavour do you think/hope you will get this time?

Ask the children to return to their groups.

Scoop 3

Tell the children to take turns to roll the dice to find out how to colour the third scoop. When all have coloured the third scoop, ask children to comment on their completed ice creams. They will be abuzz with excitement to see who has the same and who has a different combination. Before they look at many others ask them to predict if there will be any others with the same ice cream as theirs.

As before, ask the children to move around the class to find any others with ice creams coloured the same as theirs. When they have found each other they should stand together. Invite children to comment and ask questions. They should notice that, with each flavour added, there were fewer ice creams with the same flavours in the same order.

The children should be able to draw many inferences from the activity, including flavours that were possible and not possible, combinations that were possible and not possible, the likelihood of rolling a particular flavour or of getting all three scoops the same, or that another would have the same combination.

List children's observations on a chart. Collect and display completed ice creams with the chart. It will provide many opportunities for rich discussion over the coming days.

Children could also be asked to write a record of the activity.

If repeating the activity with either spinner or dice, ask children if they think they will get the same ice cream as before and how likely that would be?

Note: It is **possible** to roll strawberry, mango or blueberry
 It is **impossible** to roll vanilla or chocolate
 It is no more **likely** to roll one flavour than another, each is equally likely even if rolled before

The **likelihood** of two ice creams being the same decreases as the number of scoops increases

Ice cream scoops – our observations

I thought I would get three blueberries, but I got 2 blueberries and then a strawberry

Three people got three scoops of the same flavour

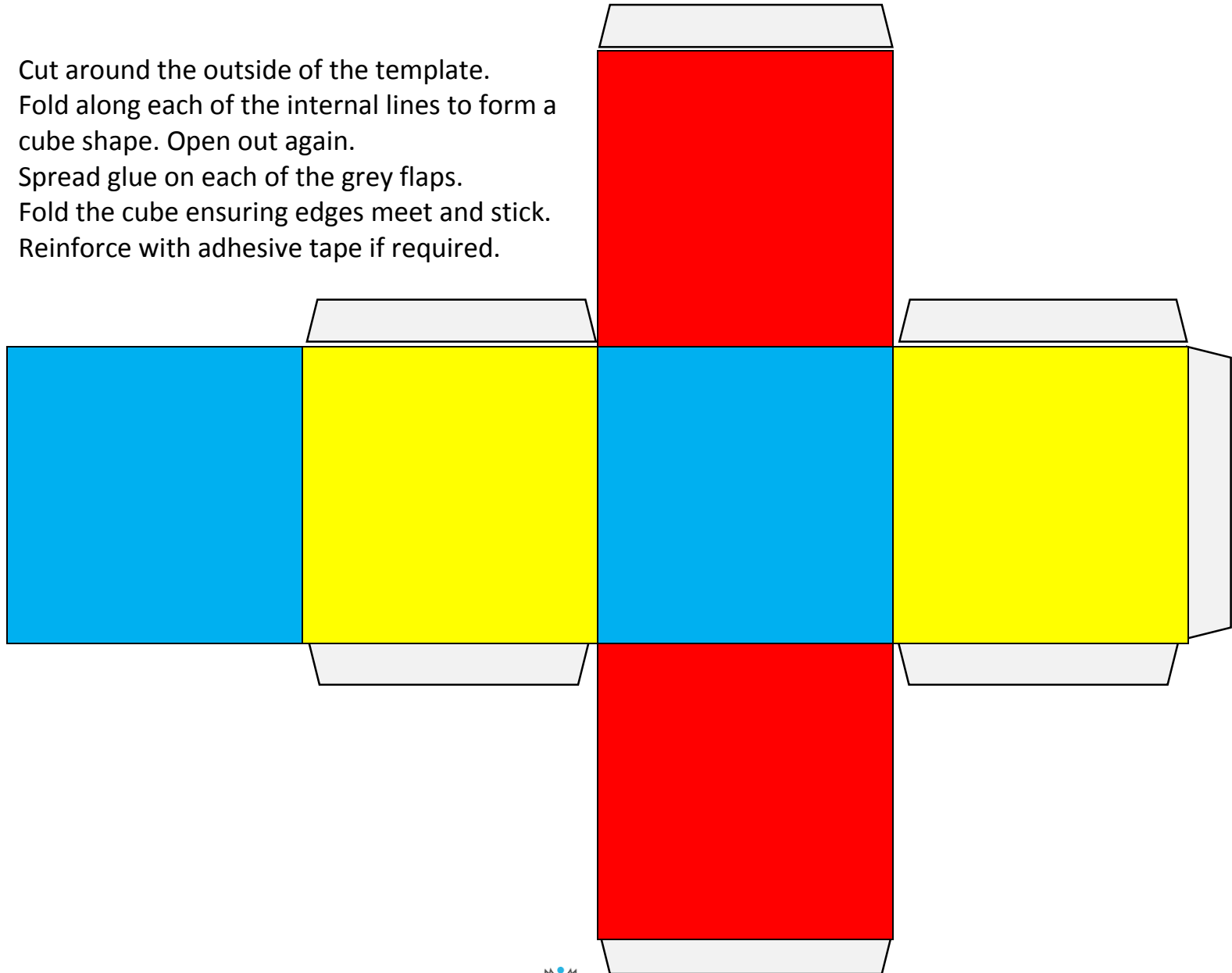
Not many people got the same combination

You couldn't get a chocolate or a vanilla scoop

Example

Red – blue – yellow dice

Cut around the outside of the template.
Fold along each of the internal lines to form a cube shape. Open out again.
Spread glue on each of the grey flaps.
Fold the cube ensuring edges meet and stick.
Reinforce with adhesive tape if required.



Red – blue – yellow spinner

Cut around the outside of the template.

Laminate.

Poke a hole in the centre and push a split pin through the middle.

Spread the tines in order to leave a gap between the head of the pin and the spinner.

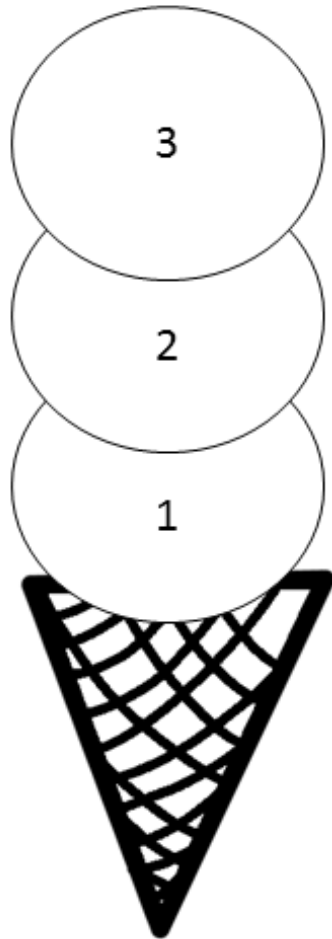
Place a large paper clip over the split pin.

Check that it moves freely. If not, readjust the tines.



Three scoops of ice cream

Name: _____ Date: _____



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