

Surface developments, true shapes & intersections

GRAPHICS WITH MR KELLY

Higher · Drawing & spatial awareness · Worksheet

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ identify correct surface developments of prisms, cylinders, pyramids and cones
- ☐ interpret common geometric forms with single cuts
- ☐ describe interpenetration and intersections of prisms and cylinders

I DO

Worked example

Read how a full-mark answer is built

A cylindrical sweet tube is 40 mm in diameter.

1 Calculate the length of the rectangle in its surface development, to the nearest mm. (1 mark)

Points that earn marks from the marking instructions: one ✓ per point

✓ $\pi \times 40 = 126 \text{ mm (125.7)}$

WE DO

Guided practice

Use the starters and word bank to help you

A company prints thousands of card packaging nets for a phone.

2 Describe two ways the production of the packaging could be made more environmentally friendly. (2 marks)

Sentence starters

One ... is ..., which means ...
Another ... is ..., so ...

Word bank

vegetable · thickness · sustainable ·
environmentally · recycled · possible ·
friendly · reduce

Tip: 2 marks = 2 separate, developed points.

YOU DO

On your own

No notes. Check your answers afterwards.

3 Quick check: tick one box for each.

a) A cone develops into...

- ☐ A long rectangle ☐ A complete circle ☐ An equilateral triangle ☐ A sector of a circle

b) Fitting as many nets as possible onto a sheet...

- ☐ Reduces waste and cost ☐ Increases waste ☐ Makes folding harder ☐ Is not allowed

c) A cylinder cut at an angle has a true shape that is...

- ☐ A circle ☐ An ellipse ☐ A rectangle ☐ A parabola

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d) The length of a cylinder's development is...

- ☐ The diameter ☐ The radius ☐ $\pi \times$ diameter ☐ $2 \times$ height

4 Key terms: write the letter of the matching description next to each term.

- | | | |
|--------------------------------|-------|---|
| 1. Surface development | _____ | A Extra flap on a net to join edges. |
| 2. Cylinder development | _____ | B Rectangle of length $\pi \times d$, plus two circles. |
| 3. Cone development | _____ | C The flat net that folds to make a 3D form. |
| 4. Glue tab | _____ | D A sector with radius equal to the slant height. |

Two cylindrical pipes of different diameters meet at 90° .

5 Describe how the curve of intersection is found on the elevation. (3 marks)

6 Explain what is meant by 'Line of intersection'. (2 marks)

7 Explain what is meant by 'True shape of an angled cut through a cylinder'. (2 marks)

Check and reflect

Mark your answers with the answer sheet. Go back to the checklist on the site and re-rate each “I can” statement above. Which one still needs work?
