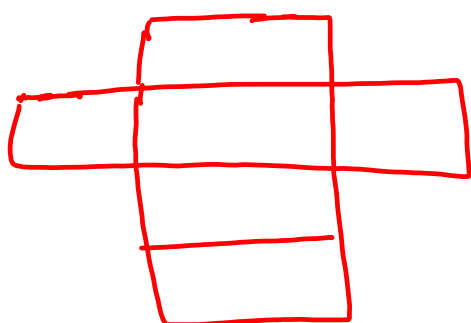
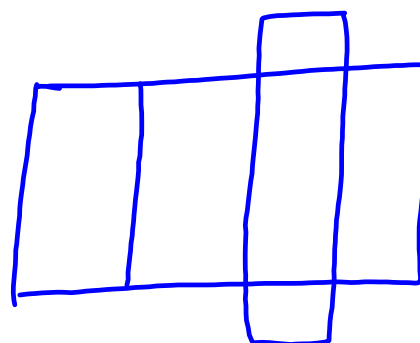


Solutions

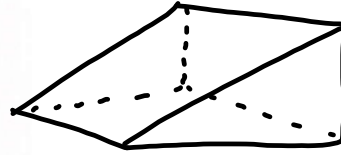
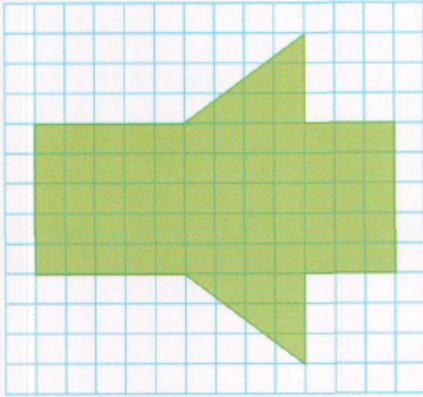
3. Use a net to construct a model of the rectangular prism.



4. Use a net to construct a model of the square-based prism.



5. Make a copy of the net on grid paper. Add flaps and then use the net to construct a three-dimensional figure. What type of figure is it?



Triangular prism

6. Sketch the skeleton of each three-dimensional figure. How many pieces of straws do you need to build each polyhedron?

a) cube

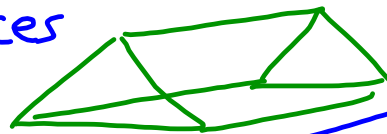
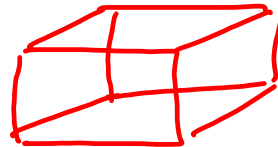
• 12 pieces

b) triangular prism

• 9 pieces

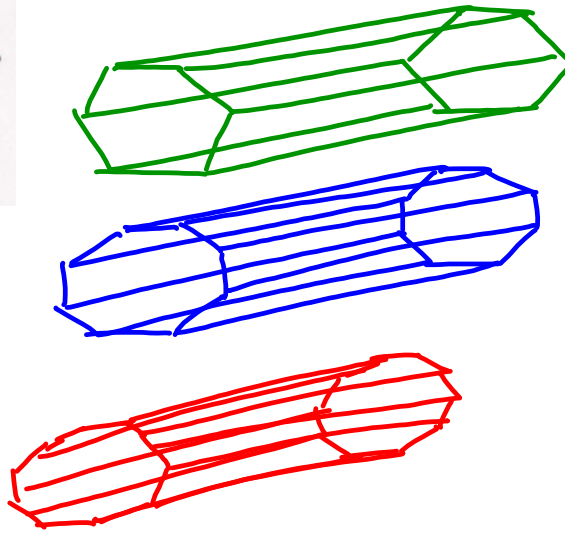
c) pentagonal prism

• 15 pieces



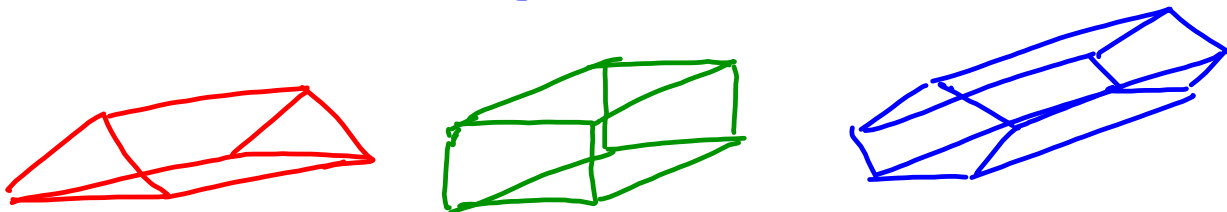
7. Sketch the skeleton of each three-dimensional shape. How many straws do you need to build each polyhedron?

- a) hexagonal prism • 18
- b) octagonal prism • 24
- c) decagonal prism • 30



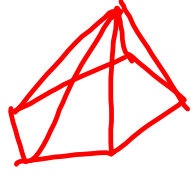
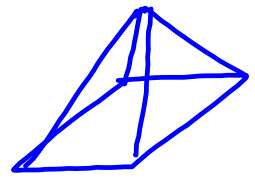
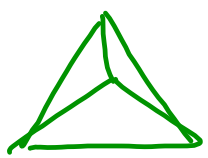
8. Construct a skeleton of each prism. Record the number of edges and the number of vertices for each.

- a) triangular prism • 6 Edges, 4 Vertices
- b) rectangular prism • 12 Edges, 8 Vertices
- c) pentagonal prism • 15 Edges, 10 Vertices

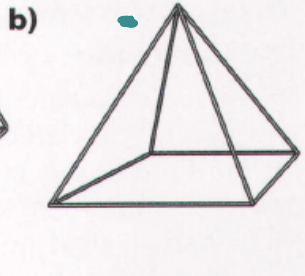
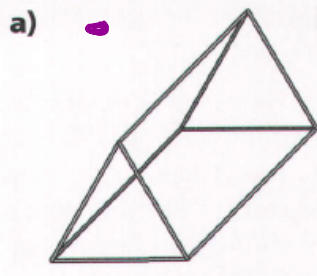


9. Construct a skeleton of each pyramid.
Record the number of edges and the number of vertices for each.

- a) triangular pyramid • Edges 6, Vertices 4
- b) square pyramid • Edges 8, Vertices 5
- c) pentagonal pyramid • Edges 10, Vertices 6



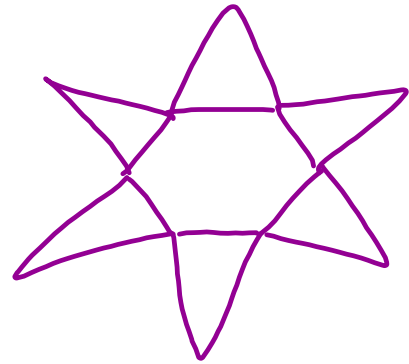
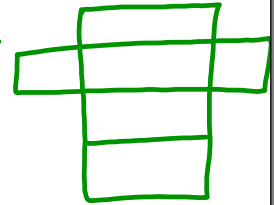
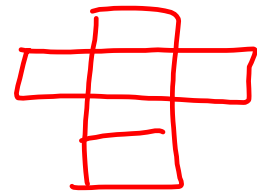
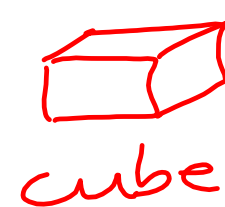
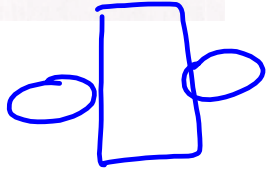
10. The frames for two different children's tents are shown. Find the number of faces, vertices, and edges of each.



$F = 5$	$F = 5$
$V = 6$	$V = 5$
$E = 9$	$E = 8$

11. Sketch each real-life object. Identify which polyhedron it most resembles and draw its net.

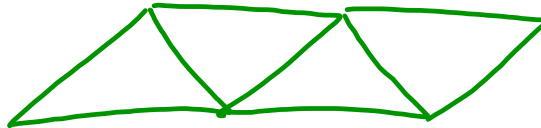
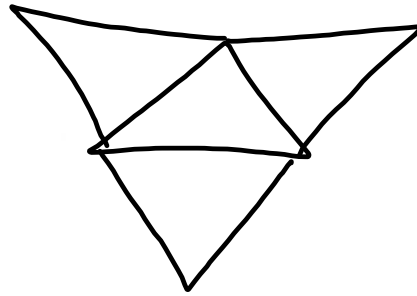
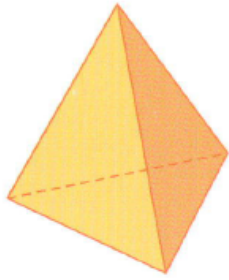
- a) an ice cube •
- b) a mailbox •
- c) a doorstep •
- d) a six-sided teepee •



12. How many pieces of straw do you need to build a skeleton to model each real-life object in question 11?

ice cube \rightarrow 12
 mailbox \rightarrow ?
 doorstep \rightarrow 12
 six-sided teepee \rightarrow 12

13. Use sketches, or a polyhedron set, to draw two different nets for a triangular pyramid.



16. a) Use the models you have built for earlier questions. Copy and complete the table.

Polyhedron	Number of Faces, F	Number of Vertices, V	Number of Edges, E
Triangular pyramid	4	4	6
Square-based pyramid	5	5	8
Pentagonal pyramid	6	6	10
Triangular prism	5	6	9
Rectangular prism	6	8	12
Pentagonal prism	7	10	15

- b) Examine the data in your table. Find a pattern that relates the number of faces, vertices, and edges in a polyhedron. Try building more polyhedra to test your hypothesis.

$$F + V - 2 = E$$

This is known as Euler's law [Oiler]