

Figure It Out

An extension of "NASA to replace telescope in space"

The famous Hubble Space Telescope enabled us to look further into space than ever before. The images it sent back revealed much about the history of our galaxies. The Hubble will be retired in October this year. It is to be replaced by a much larger and more sophisticated one – the James Webb Space Telescope. To find out more about this engineering marvel, read the article “**NASA to replace telescope in space**,” (pages 8 and 9, *What’s Up* August 2017).

INSTRUCTIONS

The **primary mirror** of the Webb consists of three **movable parts** made up of a total of 18 hexagonal mirrors. These should be movable such that they fit into the nose cone of a rocket while travelling. They should also be able to unfold in space to form the primary mirror as shown in the photograph on page 8. Imagine NASA has asked you for suggestions on how best to divide the primary mirror into three movable parts. Work in pairs to respond.

1. Use the template given below to draw 18 hexagons – 6 of them on green paper, and 12 of them on blue paper. (You may use any other two colours.) Cut out the hexagons.
2. Arrange your hexagons as shown in Figure 1 below: with the blue hexagons forming the outer ring and the green ones making the inner ring.
3. Your task is to figure out how to form a paper model of the space telescope’s primary mirror. Reminders: the primary mirror has three movable parts; each mirror piece cannot be folded. Assume that the maximum horizontal width of each movable part is three hexagons placed side by side.
4. Referring to the figure below to remind you of the overall shape, manipulate the hexagon pieces to figure out how your primary mirror will work. Use blu tack on the underside to join the pieces of each movable part.

