BLUEPRINT FOR SPACE

It's time to unveil the blueprint for your space telescope. Each dot in this puzzle has a sum beside it. Start by completing the sums then join the dots according to the key below.

**KEY**

<table>
<thead>
<tr>
<th>Component</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antenna</td>
<td></td>
</tr>
<tr>
<td>Sunshield</td>
<td>Even Numbers</td>
</tr>
<tr>
<td>Primary Mirror</td>
<td></td>
</tr>
<tr>
<td>Secondary Mirror</td>
<td></td>
</tr>
<tr>
<td>Mirror Support</td>
<td>Odd Numbers</td>
</tr>
<tr>
<td>Structure</td>
<td></td>
</tr>
<tr>
<td>Control System</td>
<td></td>
</tr>
</tbody>
</table>

Some components are missing a visual key. Can you colour them on the diagram and add the colour to the key?
MEGA MIRROR ENGINEER

A space telescope needs a big mirror, called the primary mirror, to collect lots of light and reflect it into its special instruments. The best way to do this is by using a symmetrical mirror. Can you design one, according to the engineering brief below?

Hi Space Explorers, I’m Piyal Samara Ratna, a mechanical engineer, and I have an engineering challenge for you. Can you design a mirror that is symmetrical, made of 19 shapes in total and has no gaps between segments so we don’t lose any precious light?

Compare your design to Webb’s primary mirror!

Start by drawing the lines of symmetry through these shapes:

Now sketch some symmetrical patterns below with the different shapes. Can you create something that meets Piyal’s criteria?
KEEP IT COOL

The infrared camera is the “eye” of your telescope. It needs to be extremely cold to work properly. Can you experiment with different ways to keep it cool? Which methods might work in space?

I want to find out…

I will need the following materials:

My method will be to:

I predict…

Draw and label a diagram of your experiment.
PACK YOUR PAYLOAD

Engineers are trying to find a way to fit the Webb telescope into the Ariane 5 rocket. Using only paper, glue and scissors, design a model of the telescope that folds to fit into the rocket’s payload bay.

Rocket Payload Bay
4.6 meters

Sunshield
approx 22 meters

Primary Mirror
6.5 meters

Your model must only use these five deployment mechanisms:

- Spring
- Fold
- Roll
- Push/Pull
- Hinge

Watch the deployment plan for Webb

PAYLOAD BAY
Create a model of Webb that folds to fit into this dotted area.
Find the words you’ve learnt in this chapter and add them to your Visual Dictionary of Deep Space at the back of the book. Words can go forward, backward and diagonally.

Target = 8 words beginning with:

C E P D M S E M