Task 1

I can investigate reflections

**Mirror Writing**

Mirrors can help you write secret messages in code! The famous painter and inventor Leonard da Vinci wrote all his notes in a mirror code. Here is his most famous painting, the Mona Lisa.

1. Write a short message at the top of a small piece of paper. Try to keep it to 4 words or less!

2. Ask a friend to hold a mirror onto the paper just above it as shown

3. Look at the reflected message. It is almost impossible to read! Carefully, copy the reflected message onto another sheet of paper

4. Ask a different friend to read the mirror coded message you have written. If they can't, show them how to decode your reflected message by holding a mirror above it. It will be decoded like magic!

Emergency vehicles often use mirror writing so the driver in front can read it when they are looking in their mirror.
Task 2
I can investigate reflections

Mirror Maze

A reflection in a mirror can be very confusing. This task will test your skill in the mixed up world of reflections. As you navigate the tricky mirror maze, try to work out why the task is so much more difficult than it first seems.

1. Sit at a table and place a copy of the maze in front of you.

2. Ask a friend to hold an upright mirror onto the table just beyond it so you can see the reflection of the maze.

3. Ask another friend to hold up a large book or a sheet of thick card between you and the maze to act as a screen. You should be able to see the reflection of the maze, but not the maze itself!

4. Using a coloured pen or crayon, trace over the maze from one side to the other. Remember, you should not be able to see your hand; you must navigate the maze using only the reflection! You may find it is harder than you think!

5. Now swap tasks so everyone in your group gets a chance to experience the strange world of mirror navigation!
Task 3
I can investigate reflections

**Mirror Multiplying**

When you make a mirror hinge (a pair of mirrors that have been taped together so they open and close like the inside of a greeting card), something rather strange can happen to objects placed in front! It is another example of the mysterious world of mirrors!

1. You may have a mirror hinge ready to use. If not, take 2 mirrors and turn them face down. Then join them together with a piece of masking tape. Trim the extra tape from the top and bottom with scissors and your mirror hinge is ready to use.

2. Open your hinge and place an object in the middle. What do you notice? Try moving it closer to one mirror than the other. What happens now?

3. Try putting 2 objects inside the hinge, e.g. 2 different coloured pencils or crayons. What happens?

4. Can you predict what the reflection will look like if you add a third coloured crayon?

5. Try different objects including some that have interesting shapes like a flower or a hand.

6. Go back to one small object like a pencil. What happens if you begin to close the hinge? How many pencils can you make?

7. Think about what is happening in the mirror hinge. Test out your ideas.
Task 4
I can investigate reflections

Reflective Surfaces

When light hits an object it bounces off it again or in other words it is reflected. If the object is rough, the light will bounce off in all directions but if it is smooth and shiny, the light beams are reflected in the same direction, giving a clear reflected image.

Look at the two reflections here. Why are the flamingos clear and the moon blurry?

1. Look around your room. How many surfaces can you find that give a clear reflection? Do they have anything in common?

2. Can you find any surfaces that reflect something of an image but no detail e.g. you might be able to see a reflection of the windows. Make a list of these. Do they have anything in common?

3. Can you find a collection of shiny objects to investigate with? Look at the reflections you can see in curved surfaces. What do you notice? Why?

4. Compare surfaces that curve outwards, e.g. the outside of a saucepan with surfaces that curve inwards, e.g. the bowl of a spoon. Look at the reflections in each. What do you notice? Why do you think this is?

An inward curve is called a **concave** curve and you will find one inside the bowl of a spoon.

An outward curve is called a **convex** curve. You will find one on the outside of a saucepan or mug.