



# Activity 1

## Simple Searches

Load a copy of ViewPoint and open the **Solar System** datafile.

Look through the database sheets, using the Preview Sheet and Next Sheet buttons and answer the following questions:

1 Which moons have an Icy surface?

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2 Which planet has the greatest diameter?

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3 How many moons has Jupiter?

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4 Which planet has the most moons?

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How many moons does it have?

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5 Which is the smallest planet?

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6 Which moon has black soot on its surface?

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7 Which planet has a solid iron core?

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8 Which moon has a surface temperature of  $-235^{\circ}\text{C}$ ?

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Now go to the List View.

Is it easier to work out some of the answers here?



# Activity 2

## More complex searches

Load ViewPoint and open the **Solar System** file.

You want to select only the sheets in the database that have information about the planets.

### Search Tool

- 1 Click on the Search Tool.
- 2 Next to 'Type' type in **Planet** then click on the **Perform Sort** tool.



*How many planets are there in the solar system file?*

### Sorting Sheets

Sort the sheets into order starting with the planet closest to the Sun and ending with the planet furthest away from the Sun.

Go to the **List View** and click on the **Sort View** tool.

Find the **RadiusOfOrbit** field and click beneath it. A 11-9 sort will appear. Click on the **Perform Sort** tool. The database is now sorted to show only the planets, and the planets are shown in order of increasing distance from the Sun.

Which planet is closest to the Sun?

Which planet is furthest from the Sun?



Click on the **Subset on/off** button to return the data to the original order.

Now that you can select and sort the sheets, use the **Search** and **Sort** tools to find the planet with (i) the greatest mass, (ii) the longest year, (iii) the most moons and (iv) the greatest diameter.



# Activity 3

## Spotting Patterns

You are going to do some sorting exercises to look for patterns linking:  
(i) mass and surface gravity  
and  
(ii) the length of a planet's year and how far it is from the Sun.

Load a copy of ViewPoint and open the **Solar System** file.

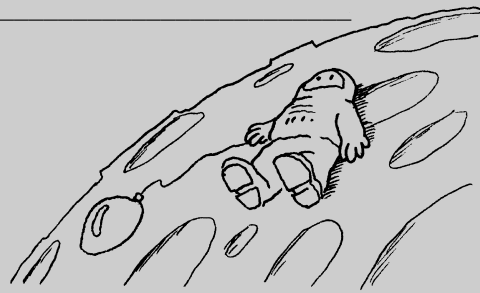
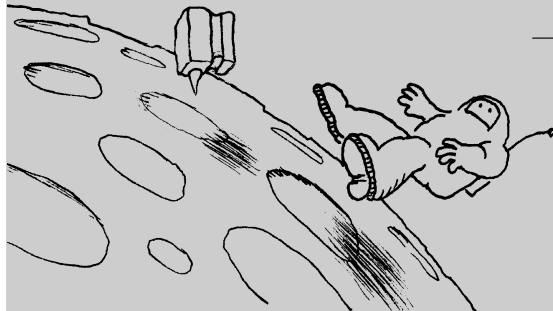
1 Sort the planets into order of increasing mass.

2 Which planet has the greatest mass? Which planet has the smallest mass?

3 Use the database to sort the planets into order of increasing gravity.

4 Which planet has the strongest gravity?

Which planet has the weakest gravity?



5 Look at the answers to questions 2 and 4.  
Is there a link between the strength of a planet's gravity and its mass?

What is the link?

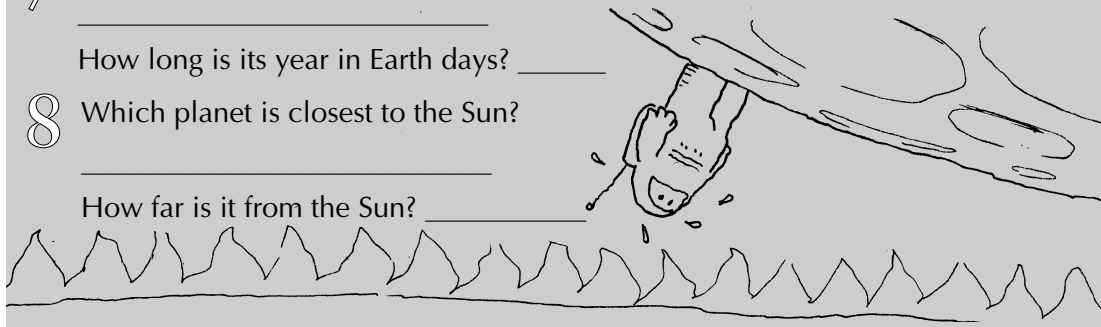
6 Do the other planets in the solar system fit the same pattern?

7 Which planet has the shortest year?

How long is its year in Earth days? \_\_\_\_\_

8 Which planet is closest to the Sun?

How far is it from the Sun? \_\_\_\_\_



9 Look at the answers to questions 7 and 8.

Do you think there is a link between the length of a planet's year and how far away it is from the Sun?

Do the other planets in the Solar System follow the same rule? \_\_\_\_\_



# Activity 4

## Why bother with graphs?

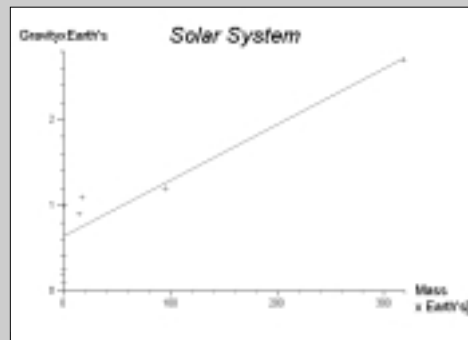
Drawing graphs helps spot patterns and relationships in data. The instructions that follow show you how to plot a line chart that should help you look at the patterns discussed in Activity 3.

Load ViewPoint and open the **Solar System** file:

- 1 Select the sheets for which **type** is equal to **planet**.
- 2 Click on the **Graph View** icon.
- 3 For the X-axis select **Mass x Earth's**.
- 4 For the Y-axis select **GravxEarths**.
- 5 Select **Scattergraph** from the styles gallery and click on the **Plot Graph** tool.
- 6 Does the graph help you to spot the link between mass and gravity?  
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- 7 Are there any planets which don't follow the pattern? Can you identify which planet it is?  
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*One problem is that there is a very wide range of planet masses. This results in the points for the small planets being very bunched up.*



- 8 To illustrate this point, click on the small arrow next to the scatter graph icon and choose **Scatter Graph with line of best fit**. Click on the **Plot graph** tool again.

*To investigate the points that are bunched up you need to perform a more refined search before plotting your line graph. The next activity shows you how to do this.*



# Activity 5

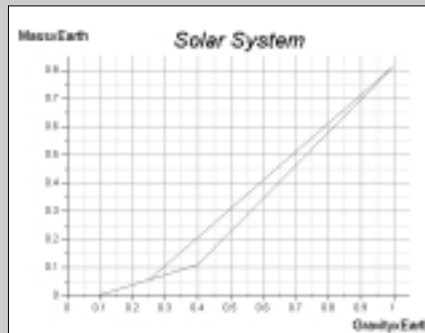
## Using Graphs to Spot Patterns

In this activity you are going to produce a graph of gravity against mass for planets that have a mass less than that of the Earth's.

Load a copy of ViewPoint and open the **Solar System** file.

- 1 Use the Search tool to select all the **Planets** and select sheets by mass is less than 1.

- 2 Go to **Graph View**.  
Can you make the right choices to make a line graph of gravity against mass that looks like this:



*NB. See the **Options** menu for adding grid lines.*

- 3 Suggest a mathematical relationship between mass and gravity, and test it.  
E.g., does doubling the mass double the gravity?

*Perhaps you managed to think of a model to link mass and gravity, but the trouble is that it is based on only 4 objects in the Solar System — pretty sparse evidence!*

*Do other bodies in the Solar System fit the same pattern?*

- 4 Return to the full database and select those bodies that have a gravity greater than zero and mass less than 1. This step sifts out incorrect or missing data — all things that have mass also have gravity.

- 5 Go to **Graph View** and plot a graph of gravity against mass for these bodies.

- 6 Can you see any pattern?

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Are there still bodies that don't fit?

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*Bodies with different masses sometimes have different densities. This may hide any pattern.*

- 7 Select only those bodies that have similar densities and plot a graph. Describe the pattern you see.