

Approach: One to one
Focus: Solar system
Resources: 4 pictures

Year: 4 & 8

Questions / instructions:

In this activity we'll talk about the moon, the sun, Earth and Mars.



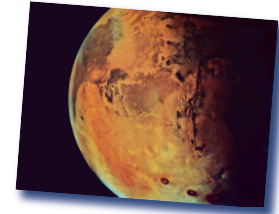
Show student moon (picture 1).

Here is a picture of the moon.

1. What is the moon? Try to tell me all that you know about the moon.

	% responses 2003 ('99)	
	year 4	year 8
satellite of the Earth (<i>travels round the earth</i>)	12 (8)	33 (26)
smaller than Earth	2 (3)	8 (5)
made of rocky materials	17 (11)	18 (17)
about 400,000kms from Earth	0 (0)	0 (0)
reflects sun onto Earth (<i>provides light at night</i>)	12 (8)	22 (16)
has lots of craters	35 (36)	42 (42)
has no atmosphere/oxygen/air/ozone/clouds, etc.	9 (21)	17 (21)
any other valid scientific response (<i>not myths or historical events</i>)	9 (10)	10 (6)
2. Imagine you have arrived on the moon. What would you notice that is different from being on planet Earth?		
no atmosphere/oxygen/air	31 (30)	45 (45)
black sky all the time	10 (8)	10 (7)
you can see the earth from there	1 (0)	3 (3)
less gravity than on Earth	6 (4)	16 (11)
[no gravity]	[25 (21)]	[37 (29)]
no vegetation/animals/people	34 (33)	44 (40)
rocky/dusty/barren landscape	27 (30)	45 (34)
no water	16 (11)	18 (18)
3. How is it that we can see the moon with our eyes?		
PROMPT: <i>What makes the moon visible to us?</i>		
light of sun reflected from moon	23 (25)	42 (46)
4. Why do you think that the moon appears to change its shape?		
PROMPT: <i>Try to explain why the moon looks different at different times of the month or year.</i>		
part seen (<i>as bright</i>) depends on relative positions of sun, moon and earth	6 (5)	18 (17)
has idea, but not well explained	16 (29)	29 (33)

Show student Earth (picture 2) and Mars (picture 3).



Here is a picture of planet Earth and a picture of planet Mars.

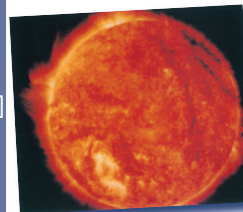
Scientists tell us that people like us cannot live on Mars but we know that we can live on planet Earth.

5. Why can't people live on planet Mars? Tell me as many reasons as you can think of.

	% responses 2003 ('99)	
	year 4	year 8
Temperature: (<i>very hot during day, cold at night</i>)		
both	3 (0)	5 (7)
just one	52 (56)	59 (51)
atmosphere issues	51 (47)	73 (71)
lack of water	34 (25)	50 (46)
lack of food	24 (19)	22 (13)

6. Why are we able to live on planet Earth? Tell me as many reasons as you can think of.

temperature suits our bodies	21 (24)	30 (26)
air/oxygen/atmosphere	52 (59)	78 (72)
water	57 (46)	72 (67)
food sources	37 (32)	41 (29)



Show student Sun (picture 4).

Here is a picture of the sun.

7. The sun is not a planet. What is the sun? star

ball of fire/gases

much bigger	13 (8)	24 (15)
extremely hot/ball of fire	84 (82)	91 (85)
no life or life requirements (<i>e.g. water/oxygen</i>)	22 (16)	37 (28)
no well defined surface (<i>outer layers gas/plasma rather than solid/liquid</i>)	6 (4)	15 (3)

Total score:	20-33	1 (0)	7 (0)
	16-19	5 (4)	20 (14)
	12-15	21 (17)	29 (29)
	8-11	33 (36)	25 (28)
	4-7	28 (29)	16 (24)
	0-3	12 (14)	3 (5)

Commentary:

Between 1999 and 2003, there has been very little change in performance for year 4 students, but a small increase for year 8 students.