

Chasing the Wind

Changing Ideas



Science is not just about the right answers. Our ideas have changed over the years so we only know what we think is correct at *any one time*. New developments in technology or ways of thinking can change our ideas very quickly - and sometimes very surprisingly!

In this activity you will work in a group to develop a talk on how ideas about the Universe have changed over time. You will do this by looking at the ideas of key scientists through history, the technology they used to make their observations and collect data, and what they concluded from the data.

Your talk will be for a Key Stage 3 audience, and you will produce a presentation.

1. You will be put in home groups where each member will be allocated the role of expert on one scientist.
2. You will then work in an expert group to become an expert on your scientist.
3. You will return to your home group to complete further tasks and develop the talk.

In your home group:

- a. Give each person one of the expert cards.
- b. Read your card to find out which scientist you will be studying.
- c. Find the other members of the class who have the same expert card as you.

In your expert group:

- a. Discuss the questions on your expert card.
- b. Visit the suggested websites, and any other sources, to answer these questions.
- c. Ensure that you have all the information to answer the questions before returning to your home group.

Return to your home group:

1. Discuss what you have found out about the different scientists.
2. Complete the questions and tasks.



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1. Complete the following table - it will help to organise the ideas the members of your home group have collected.

Scientist	New idea they had about what is at the centre of the Universe	Other important ideas about the Universe and beyond	Technology used (if any)
Ptolemy			
Galileo			
Newton			
Edwin Hubble			



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2. Answer the questions.

- a. Give two ways our ideas about the Universe have changed since Ptolemy.
- b. What are the reasons for the changes you identified in part (a)?
- c. What was the biggest change in ideas from Ptolemy to Galileo?
- d. Many people did not accept Galileo's ideas at the time. What evidence did they use to disagree with Galileo?
- e. How was Edwin Hubble able to develop ideas beyond our Universe and what were these ideas?

3. Develop a 5 to 8 minute talk about how our ideas about the Universe have changed over time. Explain how different scientists have contributed to these developments. If you can, use ICT to prepare a presentation to illustrate your talk. The presentations *Preparing your presentation* and *Delivering your presentations* may help you do this.

Remember!

- Work as a team.
- Allocate tasks to all members of the team.
- Keep it simple.
- Put the key points on your slides.
- Never have more than 35 words on each slide.
- Make it visual: use pictures and diagrams to explain and illustrate key ideas.
- Make notes covering what you want to say for each slide.
- Check that you've covered Who, What, When, Where, Why and How.

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Ptolemy



Questions:

1. When did Ptolemy live?
2. Where did he live?
3. What was his most important idea about the Universe?
4. What other ideas did he have?
5. What observations/evidence did he use to support these ideas?
6. How did he make these observations? What technology did he have to help him?
7. How did his ideas differ from or develop existing ideas?

Useful Websites:

<http://www.phys6.org/stargaze/Ssosys.html>
<http://www.worldalmanacforkids.com/explore/space/ptoely.html>
http://en.wikipedia.org/wiki/Ptolemaic_system
<http://cse10.phys.utk.edu/astr161/lect/retrograde/aristotle.html>
<http://astronomynotes.com/history/s3.html>
http://encarta.msn.com/encyclopedia_761564398_2/cosmology.html
http://www.kidspoint.org/columns2asp?column_id=1078&column_type=homework
<http://www.aip.org/history/cosmology/sitemap.html>

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Newton



Questions:

1. When did Newton live?
2. Where did he live?
3. What was Newton's most important idea about the Universe?
4. What other ideas did he have?
5. What observations/evidence did he use to support these ideas?
6. How did he make these observations? What technology did he have to help him?
7. How did his ideas differ from or develop existing ideas?

Useful Websites:

<http://astronomynotes.com/history/>
http://encarta.msn.com/encyclopedia_761564398_2/cosmology.html
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Galileo



Questions:

1. When did Galileo live?
2. Where did he live?
3. What was his most important idea about the Universe?
4. What other ideas did he have?
5. What observations/evidence did he use to support these ideas?
6. How did he make these observations? What technology did he have to help him?
7. How did his ideas differ from or develop existing ideas?
8. Many people disagreed with Galileo's ideas. What other ideas did these people have? On what evidence did they base these ideas?

Useful Websites:

<http://es.rice.edu/ES/humssoc/Galileo/>

<http://www.pbs.org/wybh/nova/galileo>

http://encarta.msn.com/encyclopedia_761564398_2/cosmology.html

http://www.kidspoint.org/columns2asp?column_id=1078&column_type=homework

<http://www.aip.org/history/cosmology/sitemap.htm>

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Edwin Hubble



Questions:

1. When did Edwin Hubble live?
2. Where did he live?
3. What was Hubble's most important idea about the Universe?
4. What other ideas did he have?
5. What observations/evidence did he use to support these ideas?
6. How did he make these observations? What technology did he have to help him?
7. How did his ideas differ from or develop existing ideas?

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