

Subject Knowledge Notes:

- It is rare for primary aged students to have the opportunity to talk about the universe more broadly despite the large amount of curiosity that they have about it
- This lesson provides some context for what we mean when we say 'the universe' as being everything that exists including every galaxy, star, planet, moon or any other matter, living or otherwise
- The lesson also tells students about the Big Bang Theory as the key theory behind how scientists believe the universe began and what the two key pieces of evidence are for this theory

For this lesson you will need:

- An ordinary pen and a white board marker or permanent marker to draw stars and galaxies onto the balloon (it may be worth blowing up the balloon beforehand and letting it deflate so that the membrane is already stretched)

Lesson Five: What is the universe and what is it made from?

 10 minutes	<ul style="list-style-type: none"> • Students complete retrieval practice questions. Provide keywords or hints on the board for students that may require support • Teacher to model correct answers on the board – students should tick or correct their answers according to the models provided by the teacher
 5 minutes	<ul style="list-style-type: none"> • This task is designed to help students picture the number of stars which is so large that it can be hard to even imagine • Get students settled and quiet for this 'imagination task' and then read out each sentence one at a time with a game in between to give students a chance to be able to imagine the thing that you have read out • You may need to prompt students with a grain of sand or grains of another material to help them picture a grain of sand in case they have not come across a grain of sand before.
 15 minutes	<ul style="list-style-type: none"> • Introduce the key learning and then read the text as a class. • Begin reading aloud and ask children to follow under each word with their finger. • Switch readers every so often. • Emphasise any words in bold as key words/phrases. • After each section of text, pause the reading, read the question(s) to be answered and ask students to discuss with a partner what they think the answer will be to that question • Give students the required time (1-2 mins depending on writing speed) to complete an answer to the question independently • If any student is waiting, they can read the next part of the text in preparation for reading it together as a class
 10 minutes	<ul style="list-style-type: none"> • This is a simple match up task to help consolidate the key information provided in the comprehension above • Give students time to read through each statement with a partner and try and match up the words to the correct description • Go through the correct answers as a class and ensure that students make any corrections where required.
 15 minutes	<ul style="list-style-type: none"> • Introduce the key learning and then read the text as a class. • Begin reading aloud and ask children to follow under each word with their finger. • Switch readers every so often. • Emphasise any words in bold as key words/phrases.

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	<ul style="list-style-type: none"> • After each section of text, pause the reading, read the question(s) to be answered and ask students to discuss with a partner what they think the answer will be to that question • Give students the required time (1-2 mins depending on writing speed) to complete an answer to the question independently • If any student is waiting, they can read the next part of the text in preparation for reading it together as a class
 10 minutes	<ul style="list-style-type: none"> • This task provides a visual representation of the universe expanding using a balloon. Demonstrate it by doing the following: <ul style="list-style-type: none"> - Gently blow up the balloon halfway to the point of inflation. State that this balloon represents the universe as we see it today - Draw dots on the balloon and a few simple spiral shapes to represent galaxies. State the dot and the spirals represent stars and galaxies - State that what we see next is what scientists can see happening to the whole universe. Inflate the balloon further (closer to the stage of being fully deflated). Ask children what they think scientists can observe happening to the universe. - Explain that we can see galaxies and stars moving away from each other in all directions – this tells us that the universe is expanding. - Ask how we might be able to use the balloon to imagine what the universe would look like if we went backwards in time (?). Allow the balloon to slowly deflate until it is almost fully deflated. - Explain that this is why scientists believe that the whole universe started from one single point that exploded outwards that we call the Big Bang Theory <p><i>NOTE the danger of this model is that it makes it seem like the galaxies and stars themselves are expanding – this is not the case. It is simply that the stars and galaxies are moving away from each other in all directions.</i></p> <p><i>You could also explain that scientists have also detected some leftover heat spread out across the universe which counts as another piece of evidence that the universe must have been very hot everywhere from a big explosion that happened a long time ago.</i></p> <ul style="list-style-type: none"> • Give students time to complete the sentences on page 26 to consolidate their understanding of this model
 10 minutes	<ul style="list-style-type: none"> • Students to draw simple sketches of the two pieces of evidence that scientists have for the big bang <ol style="list-style-type: none"> 1) Expansion – this could be dots with arrows to show that the stars and galaxies are moving away from each other 2) Leftover heat – a figure of a scientist could be looking at parts of the sky all around them and see heat everywhere they look
 10 minutes	<ul style="list-style-type: none"> • Ask children to think about why the fact that the Big Bang Theory is quite a new theory might mean that some scientists are not sure if it is definitely correct or not. • After 5 mins, ask children to raise their hands to share ideas. Encourage children to use the sentence stem: <i>“I think some scientists may not be sure that the new Big Bang theory is correct because _____”</i>
	<ul style="list-style-type: none"> • Return to page 3 and explain what the universe is and what it is made from.

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5 minutes	
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