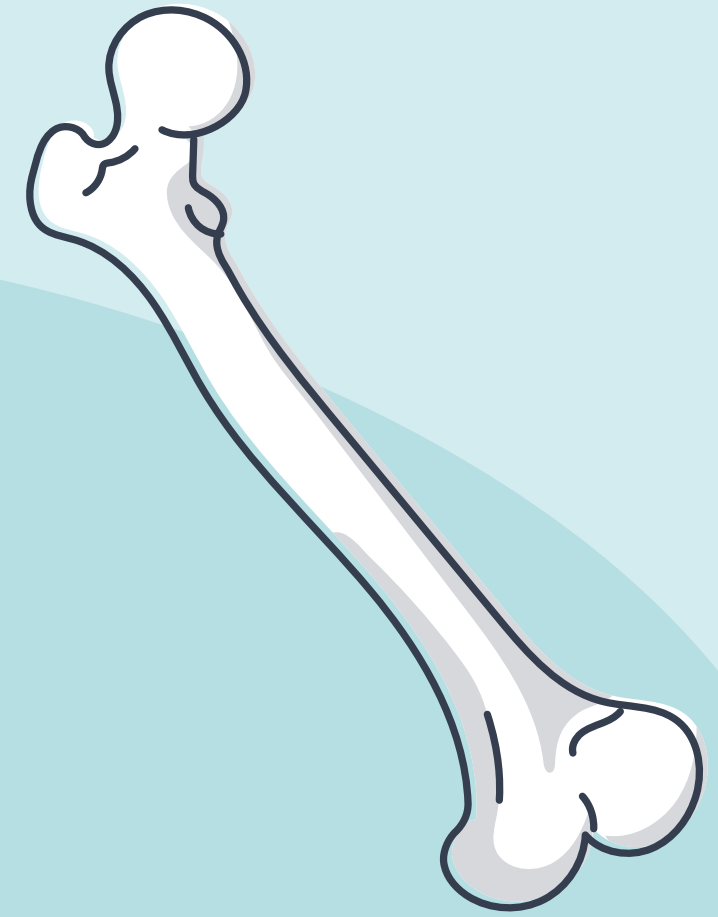

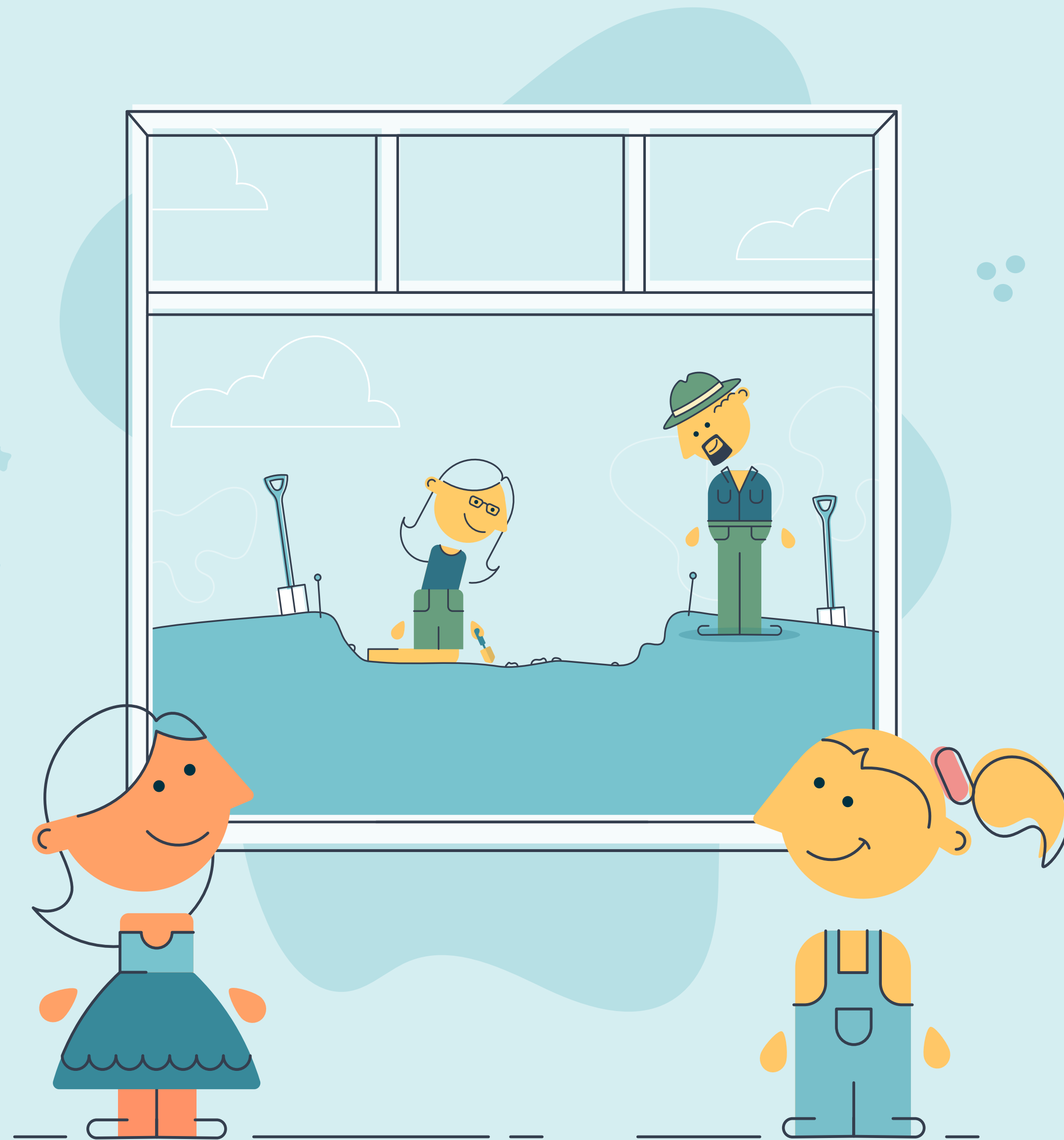


# Ellie and the Stone Age discovery





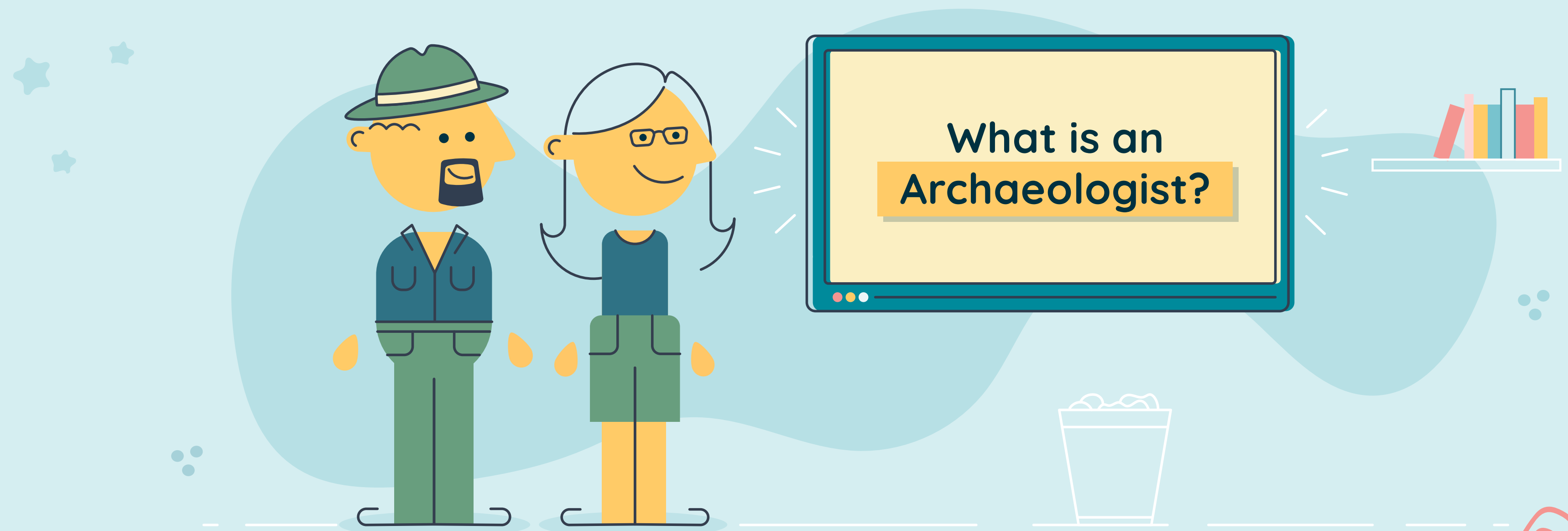
Just as the class had been dismissed for lunch, Ellie looked out of the classroom window towards where the new school library was to be built.

“Look! The archaeologists are busy digging again!”, she said to her friend, Priya.

Priya stood up. “I think they might have found something. They’re shouting and waving for people to look.”

Soon quite a crowd of children had gathered around the window.

“It must be something pretty cool,” said Ellie excitedly. “I really want to see what it is!”



When the children returned from lunch, there were some visitors waiting for them.

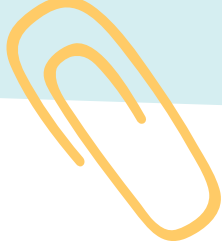
Ellie's teacher, Mr Jones, introduced the visitors. "This is Harriet and Alex. They are archaeologists. They wanted to share some exciting news with you!"

"Do you know what an archaeologist is?" Alex started by asking the children.

"Is it someone who works with dinosaur bones?" asked Fabian.

"That's a palaeontologist. An archaeologist is someone who digs in the ground to find

objects people have left behind. It might be tools, bones or even buildings. We can use these objects, called artefacts, to find out more about how people from long ago lived and what they were like," replied Harriet.



“Why are you digging in the soil where our new library is going to be? Isn’t that the job of the builders?” asked James.

“Good question! Before anything is built, archaeologists must look in the soil at that site. We need to see if there is anything important from the past buried there. It might tell us about the people that lived here many years ago.” explained Alex.

“In fact, when we were digging, we did find some amazing artefacts. Would you like to see them?” Harriet started opening the box she was holding.

“Yes!” shouted the children enthusiastically.





Harriet lifted an artefact out of the box. Ellie could see it was made of stone. It looked heavy.

“This is an axe head. It’s made of flint and would have been used for building, hunting, and maybe even fighting. It was really important to people who lived at that time.”

“We also found these arrowheads which suggest these people were ‘hunter gatherers’. They got their food by hunting or foraging,” Alex explained.

“Look at this bone pin. It was used to secure clothing together. It gives us an idea of clothing they might have worn. What time period do you think these artefacts are from?” asked Harriet.



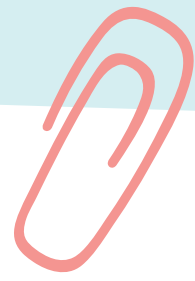
“Was it the Stone Age?” asked Miho.

“It was!” said Harriet. “It’s called that because many of the artefacts left behind by humans were made of stone.”

“To get an idea of how old artefacts from the Stone Age are, I want you to sort these objects into the order of how quickly they would rot away,” said Alex.

Ellie thought the bone would take the longest to rot away.





“To give you a clue, organic materials rot away quicker. Do you know what an organic material is?” asked Harriet.

“It’s something that was once living, like plants and animals. It’s made of natural materials,” said Ellie.

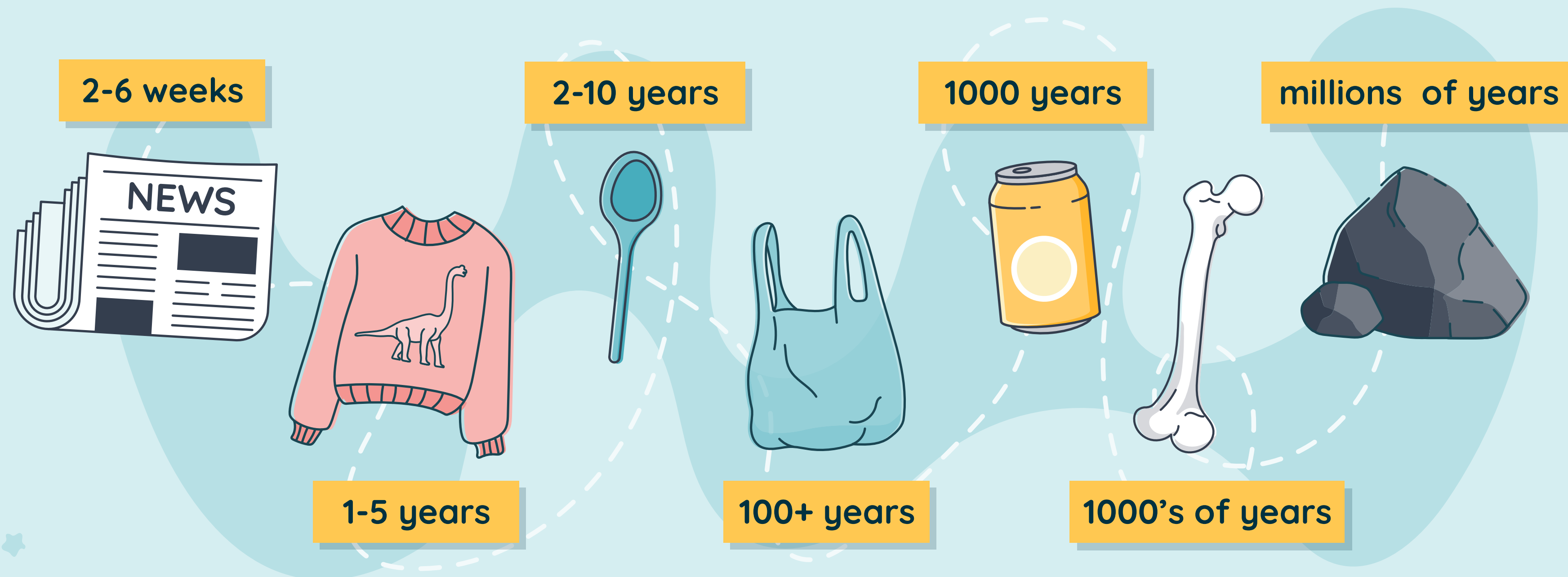
“Correct. Which of these objects is organic?” asked Alex.

“The woollen jumper, newspaper and wooden spoon,” said Raja.

“Well done. The rest are inorganic, they are not made of anything that was living.

So materials like rock, minerals or plastic. They take longer to rot away.” said Harriet.

“Bone is organic and inorganic! It comes from humans or other animals, but also contains minerals,” explained Alex.



“Did you get them correct? What stays, what rots away?” asked Mr Jones.

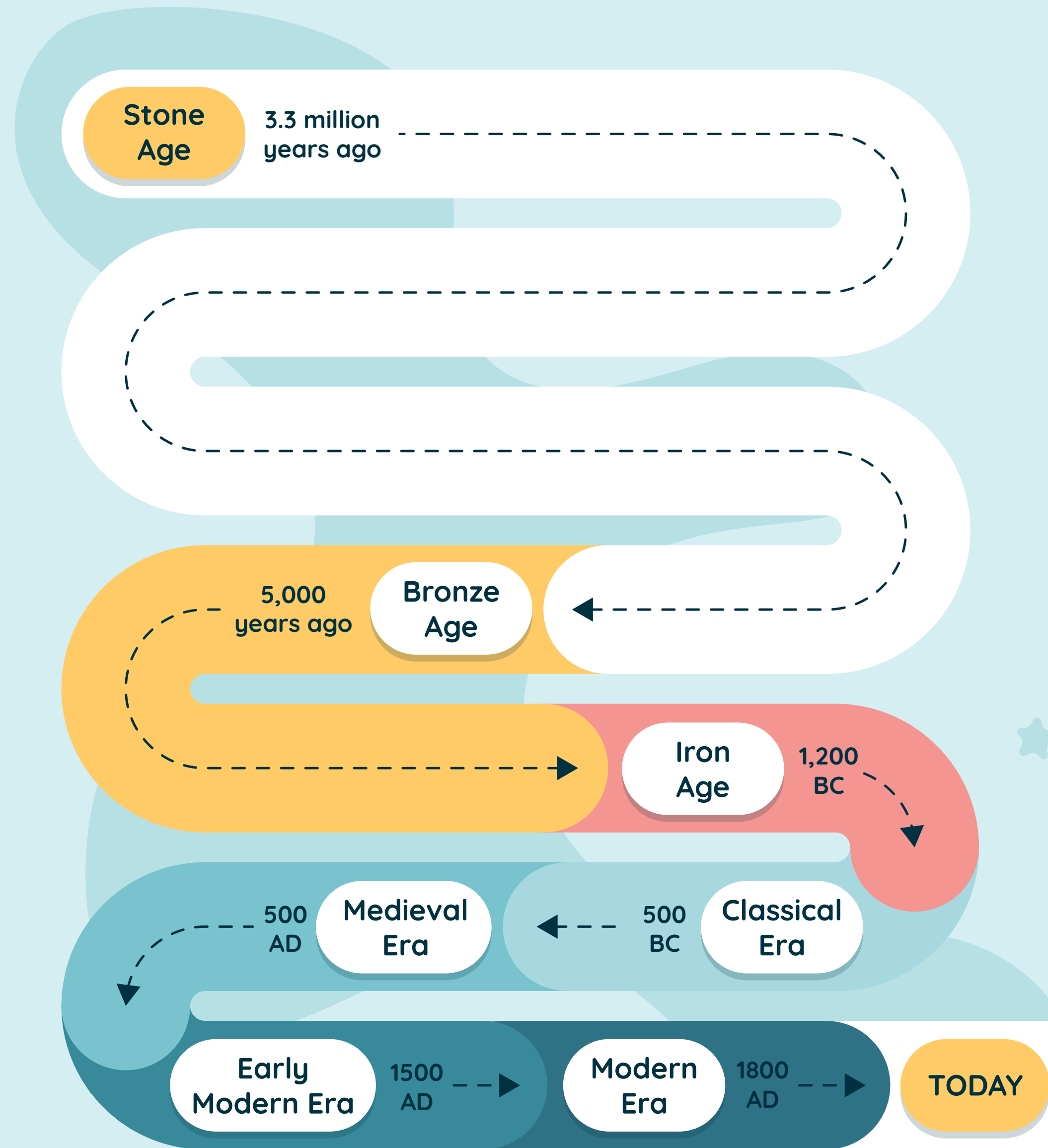
Ellie couldn't believe the rock took longer than the bone to rot away!

“The Stone Age started about 3 million years ago and ended about 5,000 years ago. The only artefacts which remain after all that time are made of stone or bone. The rest will have rotted away. It doesn't mean they didn't use objects made of wood or wool though!” said Alex.

“We made another discovery this morning. It's very exciting. Stone Age chewing gum!”

The children gasped with excitement.

“Really?” asked Fabian.







Harriet held up a black, shiny piece of stone.

“This is birch tar. It’s sap from a silver birch tree which has been heated up. The heat makes it turn black and sticky like glue. It goes hard when it cools down. Stone Age people used it to hold the stone in place on their spears and other tools.”

Alex continued, “We found teeth marks in it! We think people from the Stone Age chewed it, like chewing gum to make it more squashy. It is an antiseptic, so it may have helped them with toothache too.”

Mr Jones knew some pupils would have forgotten what an antiseptic is, so he gave a brief explanation before Harriet continued:

“The person who chewed this birch tar may have left their DNA behind!”



Priya was about to ask what DNA was, but then she remembered that DNA had been explained to the class by Dr Russell the day Priya and Ellie found an unusual creature under the big tree outside.

Priya recalled Dr Russell saying DNA is a set of instructions to build you.

“If we can collect DNA that belonged to the person who chewed the gum, we can find out whether it was a girl or a boy, as well as the skin, hair and eye colour.” said Harriet.

“Wow!” said Ellie.

“It is amazing.” agreed Harriet. “We usually get DNA from ancient bones or teeth. In this case, it’s just from something they chewed!”

“The gum is really old, at least 6,000 years, so we might not get DNA – but, would you like me to let you know the results if it works?” asked Harriet.

The children cheered!





Some months later, Alex and Harriet returned to Ellie's class to show the children the results.

"We got DNA! It showed the person who chewed the birch tar was a girl. We've called her Dora. Can you help us find out what she looked like?"

We have 26 letters in our alphabet. DNA has just four, A, C, G and T.



### Dora's skin colour

C T A A C T A T C G

### Pale skin

C T A G C T A G C G

### Medium skin

A T A G C T A G C G

### Dark skin

C T A A C T A T C G



Look at the letters. The top one is DNA from Dora. Can you find a match?"

"She has dark skin," said Ellie.

"Well done!" said Alex.

### Dora's hair colour

T T G C C A T G A T

### Dora's eye colour

G C C C G A T A C G

### Blonde hair

T T G C C A C G A T

### Ginger hair

T A G C C A G T A G

### Dark brown hair

T T G C C A T G A T

### Green eyes

G C C T G G T A T G

### Blue eyes

G C C C G A T A C G

### Brown eyes

G C C T G G T A T G

“What colour hair did Dora have?”  
asked Harriet

“She had dark brown hair,” said Mark.

“What about eye colour?” asked Harriet.

“Were her eyes blue?” asked Pat.

“That’s what the evidence shows, well  
done,” replied Alex. “Scientists think  
humans who first appeared in Africa,

over 5 million years ago, all had brown  
eyes. Then, about 6,000 to 10,000 years  
ago a single spelling mistake which  
scientists call a mutation, happened, just  
by chance. It caused a variation in eye  
colour, from brown to blue to appear in  
humans in Europe,” explained Alex.

“Scientists think it might have given  
people an advantage of being able to

deal with lower light levels in Europe  
– and at the time, may have been  
considered more attractive. As a result,  
the number of people inheriting blue  
eyes in families increased in each  
generation. This chance mutation,  
leading to changes in eye colour  
over time, is called evolution. Can you  
think of any examples of evolution in  
animals?” asked Harriet.



“Arctic foxes with their fur” suggested James, helpfully.

“Great example” responded Harriet, who continued: “We have shown you a small bit of the DNA. In real life, there are thousands of A’s, C’s, G’s and T’s. We use a computer to compare them.”

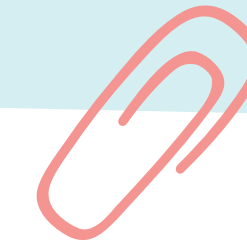
“We found DNA from other things too. We could tell she had eaten duck and hazelnuts. There were viruses and bacteria in her mouth that can cause glandular fever and pneumonia. They may not have made her feel ill,” said Alex.

“One of our team has created a picture of what she could have looked like – what do you think?”

Harriet showed the class an image on her device: “This is the face of a girl who lived 6,000 years ago. She spit out her chewing gum right where your new library is being built. DNA has enabled us to bring her story to life!”







The children were amazed. All that information from a piece of ancient chewing gum!

It got Ellie thinking about what life might have been like for her and Mags if they had lived 6000 years ago.





For more stories featuring Ellie,  
her family, friends and teddies,  
as well as accompanying  
teaching resources, visit:  
[www.abpschools.org.uk](http://www.abpschools.org.uk)



Designed by tothepoint

Story by Dr. Mandy Hartley

Geneticist, science educator and  
author of children's books.

