How to discover a dinosaur!

Anyone can find a dinosaur, and lots of people have. All you need is a little luck and a sharp eye. Here are the highlights from the moment of discovery onward.

By Sarah Hampton, with illustrations by Vector That Fox and Jack Tite

At first glance, fossils – which are the remains or traces of ancient life that have been preserved in rock – don't sound enormously exciting. But in the hands of a paleontologist, whose job it is to find, dig up and study fossils, they can provide clues that reveal fascinating things about the dinosaurs' lost world. Let's take a look.

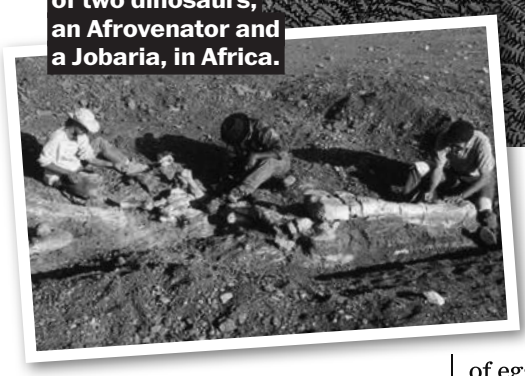
Where to look for fossils

Go to an area where rocks that were formed during dinosaur times are now on the surface. Walk back and forth looking closely at the ground, and you might find a bone or tooth sticking out of the rock. That's because wind and water can wear down the rock around a fossil, and expose it.

How to unearth a fossil

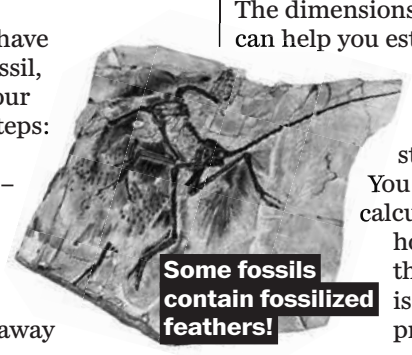
Once you have found a fossil, here are four key next steps:
Expose the fossil – once you've found part of a fossil, dig away the rock around it so the fossil is fully exposed.
Map it out – record the position each fossil or part of the fossil was found in.
Remove the fossil – carefully excavate the fossil from the rock that surrounds it. Once the dinosaur fossil is separated from the surrounding rock, cover it in a plaster cast to protect it during transport.
Scan the fossil – take X-rays and CT scans of the inside of the fossil.

Paleontologists unearth the fossils of two dinosaurs, an Afrovenator and a Jobaria, in Africa.



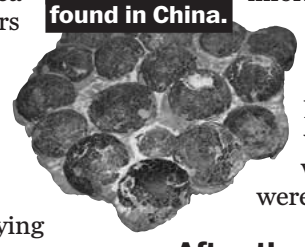
What you can find out from fossils

Fossilized bones – by studying fossilized bones, we can figure out a surprisingly large amount about the dinosaurs they came from. The dimensions of a fossil can help you estimate the dinosaur's size, weight and how strong it was. You can also calculate roughly how old the fossil is through a process called radiometric dating. Sometimes the clues are subtle: Marks on a dinosaur's fossilized teeth could be evidence of what it liked to eat, while a broken bone might reveal how the dinosaur died.
Footprints and tracks – by studying the shape of a dinosaur's preserved footprints, you can estimate how heavy it was, whether it walked on two legs or four, and even how quickly it was moving.



Some fossils contain fossilized feathers!

Eggs and nests – the first thing you can tell from a dinosaur egg is the approximate size of the baby dinosaur inside. The number of eggs, and how they were arranged within a nest or burrow also gives an idea of how dinosaurs behaved as parents and what they did to protect and take care of their young.
Poop – by studying fossilized dinosaur poop, which is called coprolite, you can tell what kind of animal made it and also what it liked to eat.



Fossilized dinosaur eggs found in China.

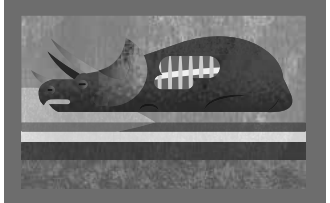
Bite marks – dramatic marks in dinosaur bones can give a more detailed understanding of how some dinosaurs fought each other and how strong they were.
Feathers – fossilized feathers can give you information about what feathered dinosaurs looked like, how they kept warm and whether they were able to fly.

After the find

Once you've studied your fossil, prepare it for display. If it's a new species, you'll have to think up a name!

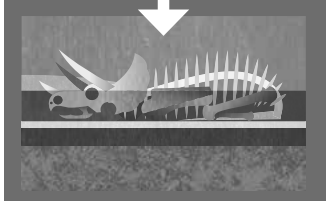
HOW A FOSSIL IS MADE

Most animals never become fossils. Their bodies just rot away or get eaten. They are only fossilized if sediment covers their bodies quickly after their death.



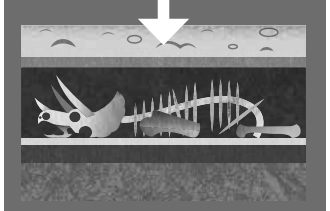
Buried whole

A creature such as a dinosaur dies and is buried by sediment. Sometimes that sediment is carried by a river, and other times the animal dies in mud and sinks into it.



Bones turn to rock

Although the dinosaur's flesh rots away, the mud protects its bones. Over time, the skeleton gets buried deeper. Minerals from groundwater fill empty spaces in the bones and replace their original minerals, turning them to rock.



Hidden for millions of years

The minerals filling and replacing the bones retain the original shapes of the bones. Over millions of years, the mud turns to rock, encasing the fossil. When the rock is broken, the fossil is revealed!

PUZZLES & JOKES

Stumped? Don't worry, you can find the solutions to all the puzzles at: **whatonearthmag.com/answers**

WINTER SPORTS WORD SEARCH

Can you spot the 12 winter sports words hidden in our word search puzzle? Good luck!

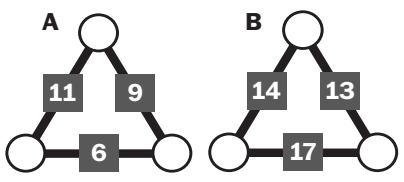
			R	W	Y	S	G							
		T	I	A	E	X	S	E	T	E				
	F	M	T	V	C	V	M	O	L	P	Y			
U	A	M	M	O	I	I	F	G	U	G	W	Y		
	M	Y	H	O	L	I	F	O	C	M	K	G	K	
C	J	S	U	G	L	H	F	K	W	J	B	C	O	A
I	L	W	T	U	R	A	Y	J	G	E	O	G	U	G
W	K	X	R	L	V	L	L	L	V	T	B	G	P	Q
S	R	S	F	R	F	F	P	S	J	S	K	A	T	E
O	X	P	F	C	B	P	F	A	M	N	D	W	L	I
	L	U	G	E	K	I	U	M	F	O	M	O	J	
	S	V	M	O	A	P	T	K	T	W	J	X	M	
		O	R	U	Q	E	V	A	F	R	A	Y		
			C	U	R	L	I	N	G	V	O			
				V	S	H	V	S						

BOB	ICE	SKATE
CURLING	LUGE	SKI
GOGGLES	MOGUL	SLALOM
HALFPIPE	PUCK	SNOW

NUMBER TRIANGLES

In the triangles below, the numbers inside the squares are the sums of the two numbers in the connected circles. For example:

Can you figure out which number should appear in each of the circles? All the numbers in the circles are between 1 and 10, and a number can only be used once in each triangle.



SUDOKU

Fill all the empty squares so that every row, column and 3x2 box contains each of the numbers 1 to 6.

3	2	6			1
5					2
		1			
2			6	1	4
	5		1		6
		2		3	

CUBE IT!

The six-sided shape on the left can be folded up to form a cube. Only two of the cubes on the right can be made by it. Which are they?