



# Living things & their habitats

**What is classification?**

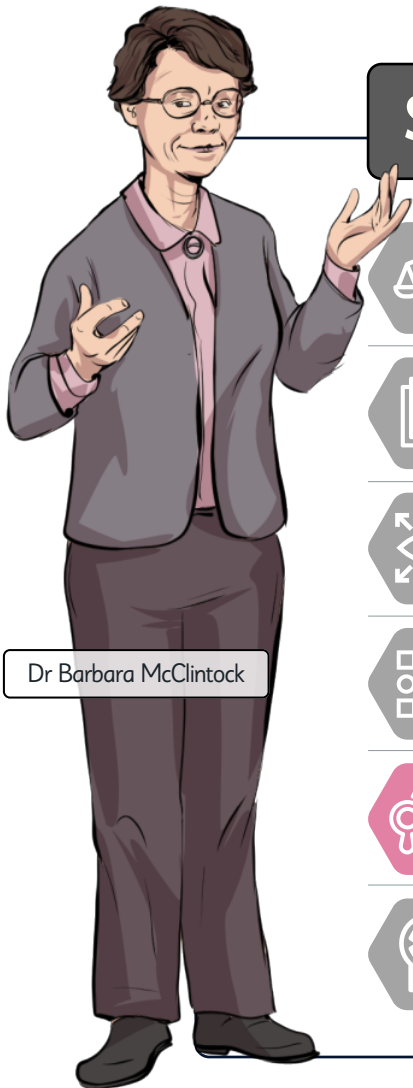
**Lesson 2:** What is a classification key?



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# Scientific enquiry types and skills



Dr Barbara McClintock

## Scientific enquiry types



Testing



Researching



Observing



Pattern seeking



Identifying & classifying ✓



Problem solving

## Working scientifically skills



Asking questions



Making predictions



Setting up tests



Observing & measuring



Recording data ✓



Interpreting & communicating results ✓



Evaluating



# What is classification?



Dr Rosalind Franklin

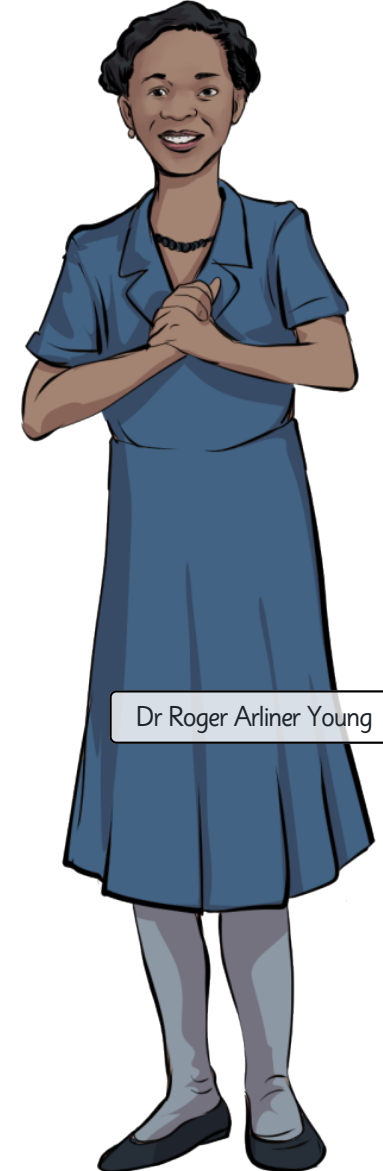
**Lesson 1:** How are animals classified?

**Lesson 2:** What is a classification key?

**Lesson 3:** How can we classify plants?

**Lesson 4:** Is yeast a living microorganism?

**Lesson 5:** What are the five main groups of microorganisms?



Dr Roger Arliner Young

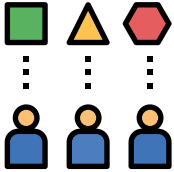


# Key vocabulary for this lesson



**identify**

– to be able to recognise what something is



**characteristic**

– a feature or part of something that helps with identification



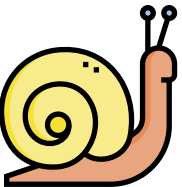
**observe**

– look carefully with attention to detail



**vertebrate**

– an animal with a backbone and internal skeleton for support



**invertebrate**

– an animal without a backbone or internal skeleton





# Identifying and classifying



Hi, I'm **Calvin**. I'm a **zoologist**. A part of my job is to **identify** and **classify** animals.



Imagine you are on a **walk through the park** and come across this **animal you have never seen** before.

How do you know **what type of animal** it is?  
How can you find out the **name** of that animal?

**Let's find out!**

**New word alert!**



**zoologist** – a person who studies animals



# How do we classify living things?



To discover the names of **unknown living organisms**, we might turn to the **internet or books** for research.

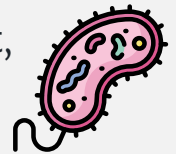
A **classification key** helps us to identify which group a **living organism** belongs to based on shared characteristics. If I find an **animal that nobody has ever seen before**, I will need to use a **classification key** to sort it into a group with animals that have **similar characteristics**.

Let's take a look at **how a classification key works!**



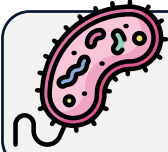
## New word alert!

**organism** – any living thing, such as a plant, animal, fungus, or bacteria





# Word detective



**organism** – any living thing, such as a plant, animal, fungus, or bacteria

The word '**organism**' comes from Greek.



**organ** + **ism** = **organism**

“body part”

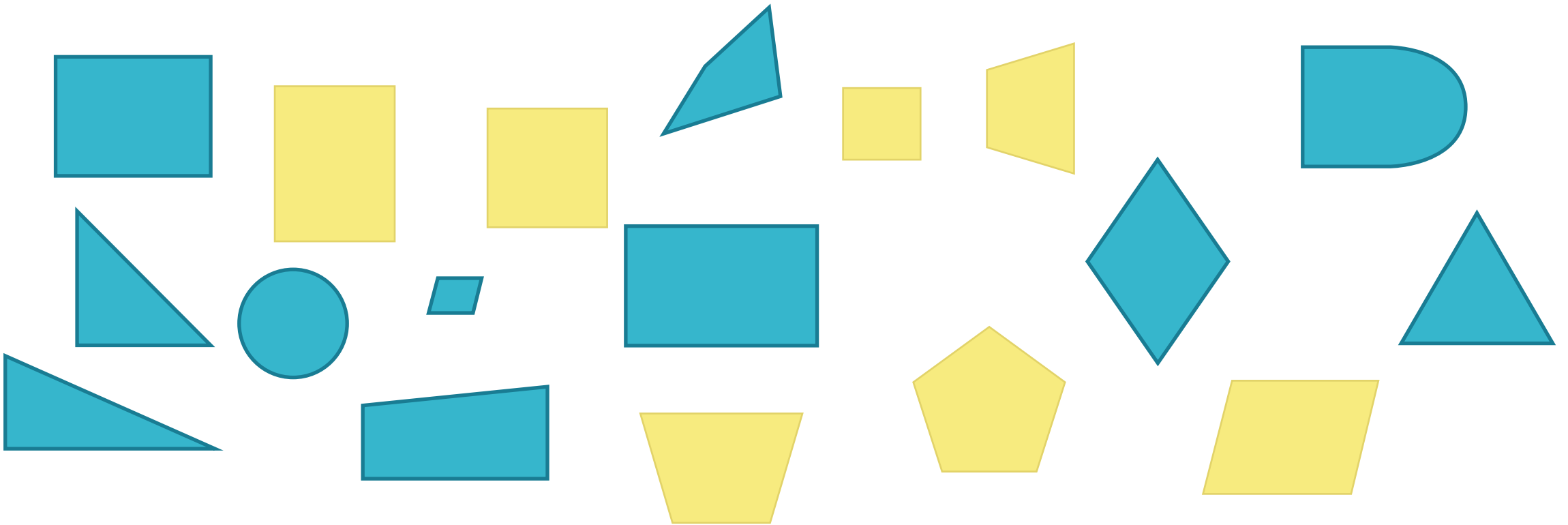
“system”

Together, these word parts mean “**a system of organs working together.**” If a creature’s system of organs is working together, then this would mean that they are living and not dead. This is why an organism is a **living thing**.



# How classification keys work

**Classification keys** don't just sort things. They help us to **identify** them. For example, I could examine the **characteristics of these shapes** and decide to **sort them by colour**.



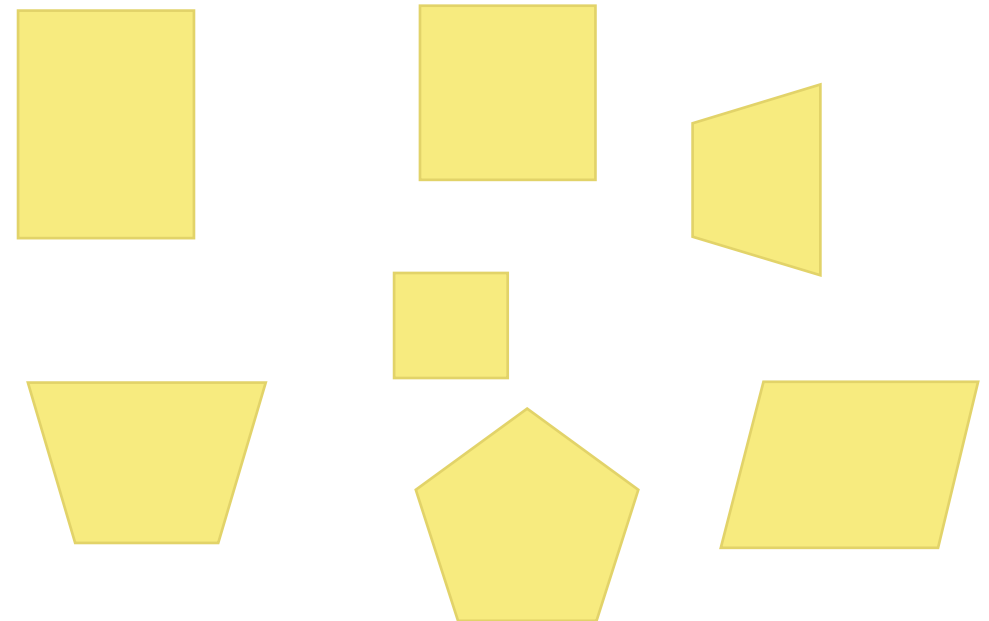
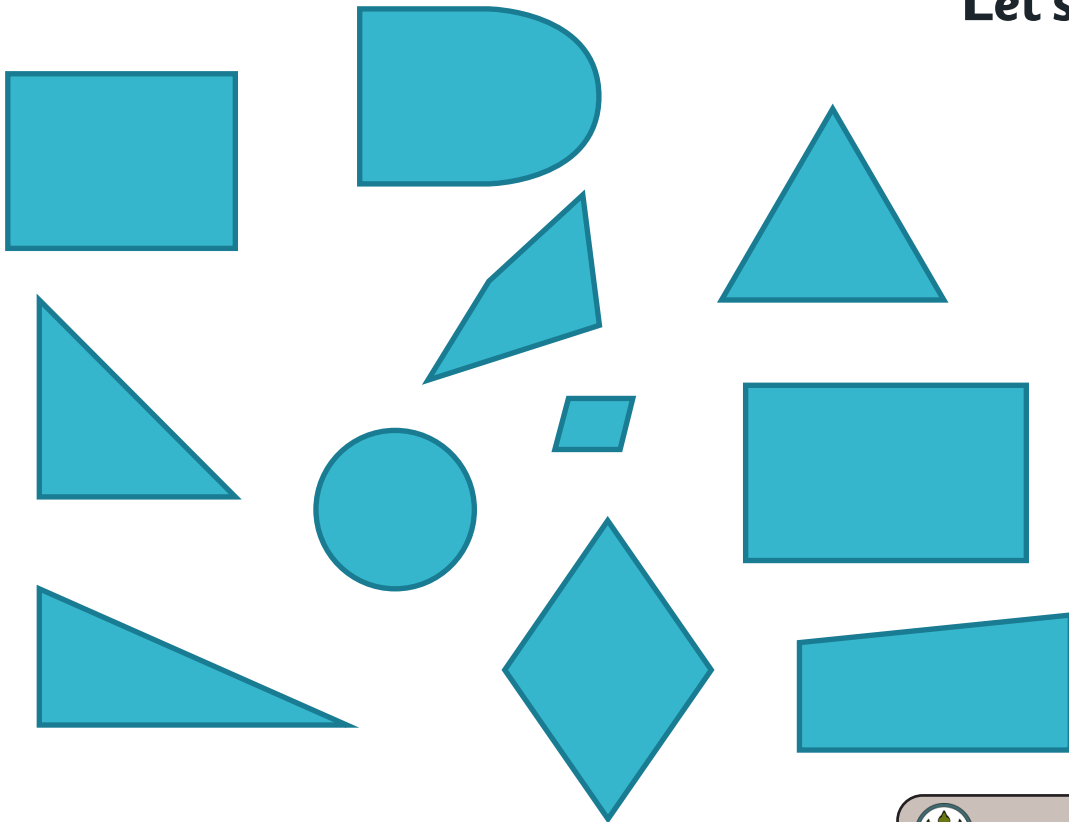


# How classification keys work

**Classification keys** don't just sort things. They help us to **identify** them. For example, I could examine the **characteristics of these shapes** and decide to **sort them by colour**.

Does it help me to **identify** what **type of shape** I have?

**Let's find out!**



# Classification criteria

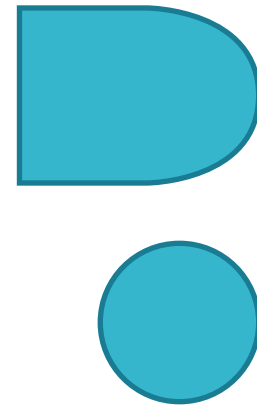
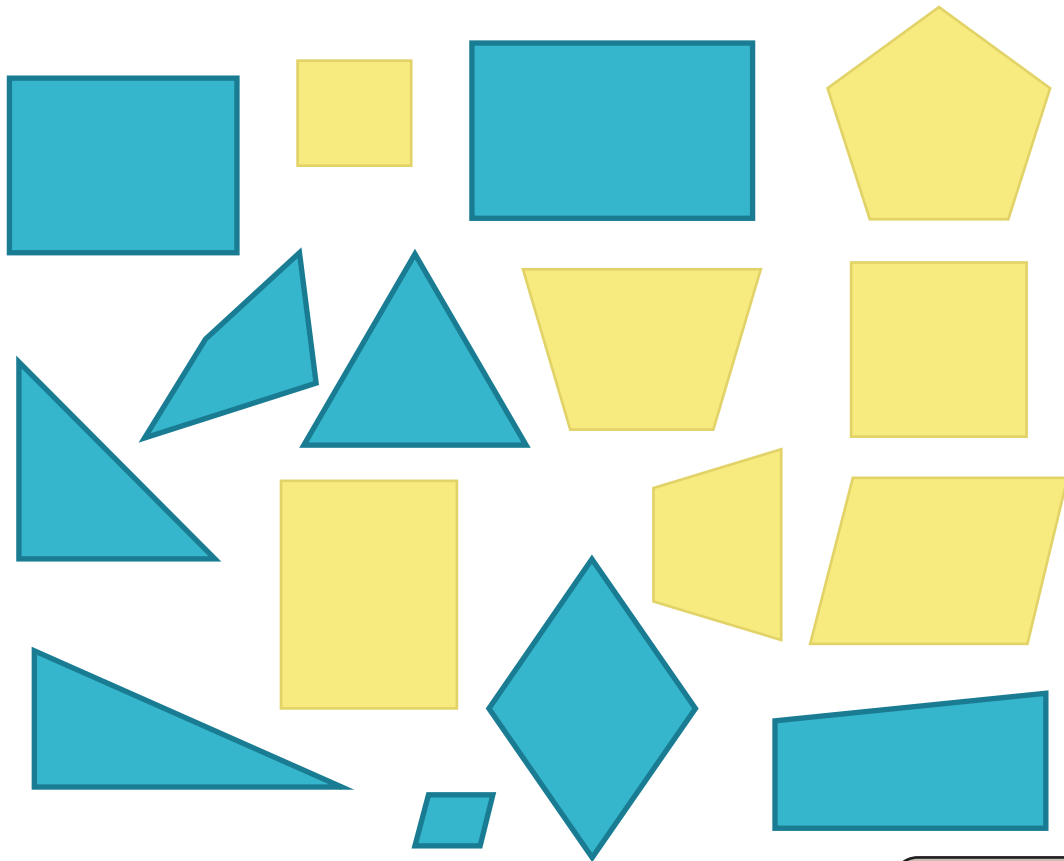
No! I need to look for **specific criteria** to begin classifying the shapes.

**polygon**

yes

Does it have straight sides?

no



Let's consider **another criterion** we could use to classify these shapes.





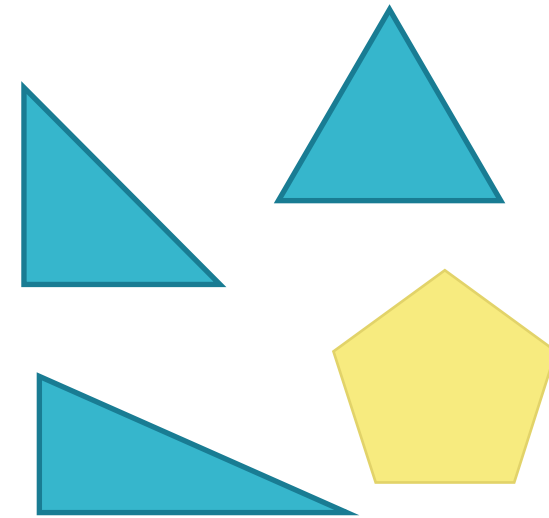
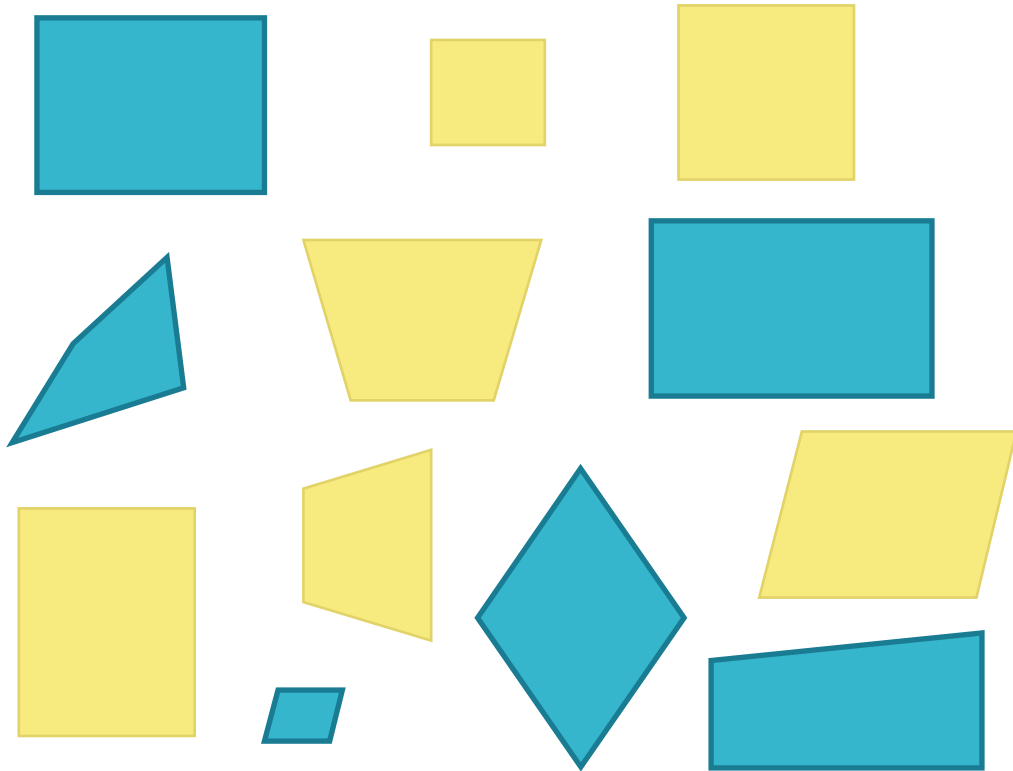
# Classification criteria

quadrilateral

yes

Does it have four sides?

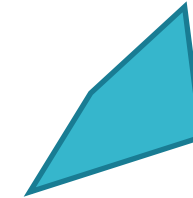
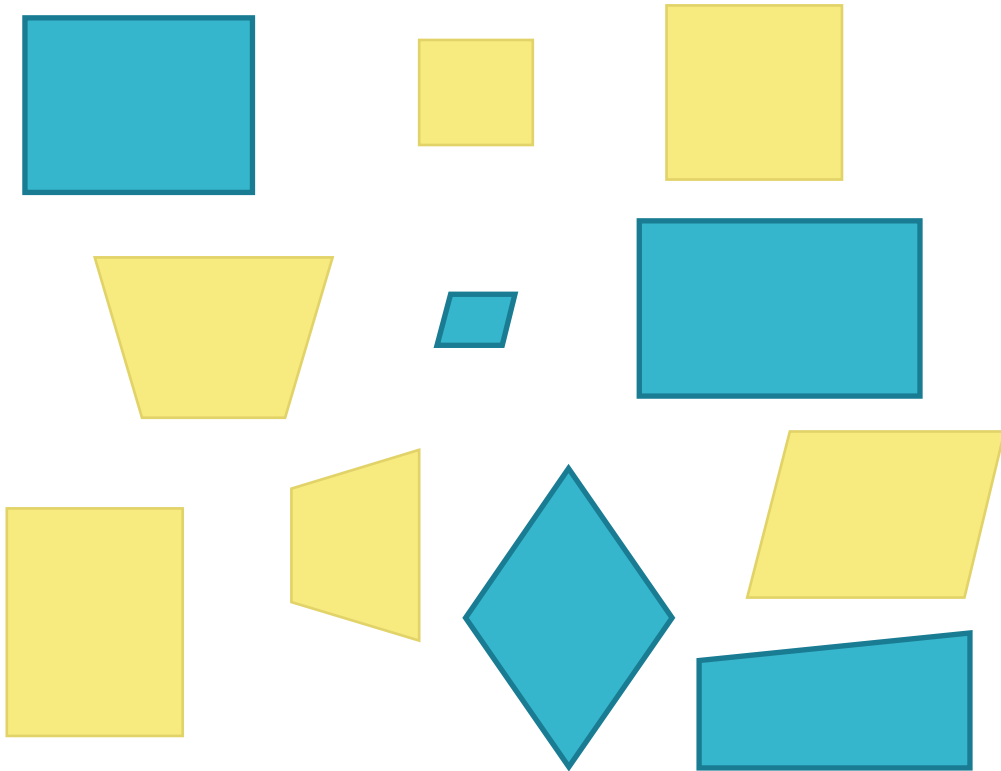
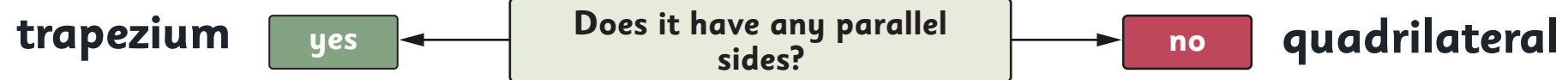
no



Let's consider **another criterion** we could use to classify these shapes.



# Classification criteria



Let's consider **another criterion** we could use to classify these shapes.



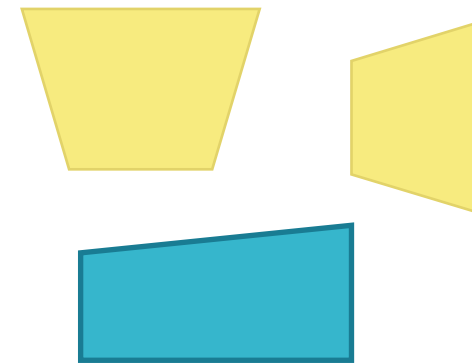
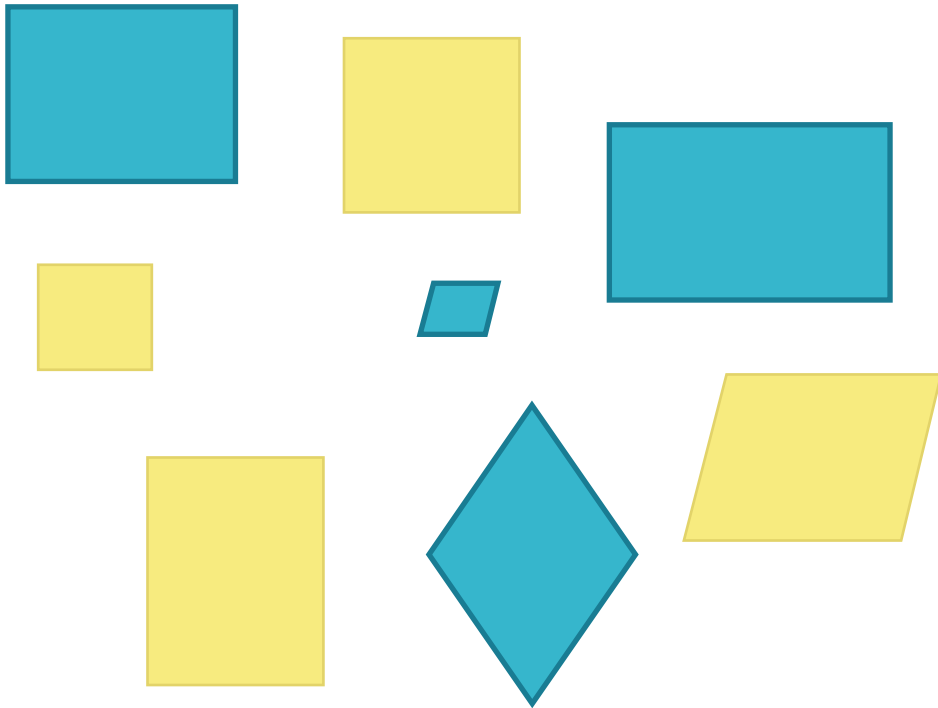
# Classification criteria

parallelogram

yes

Does it have two pairs of parallel sides?

no

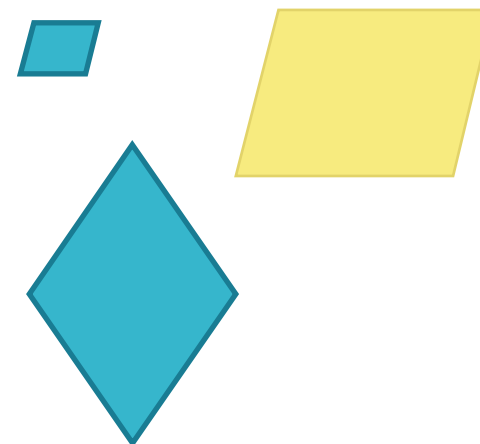
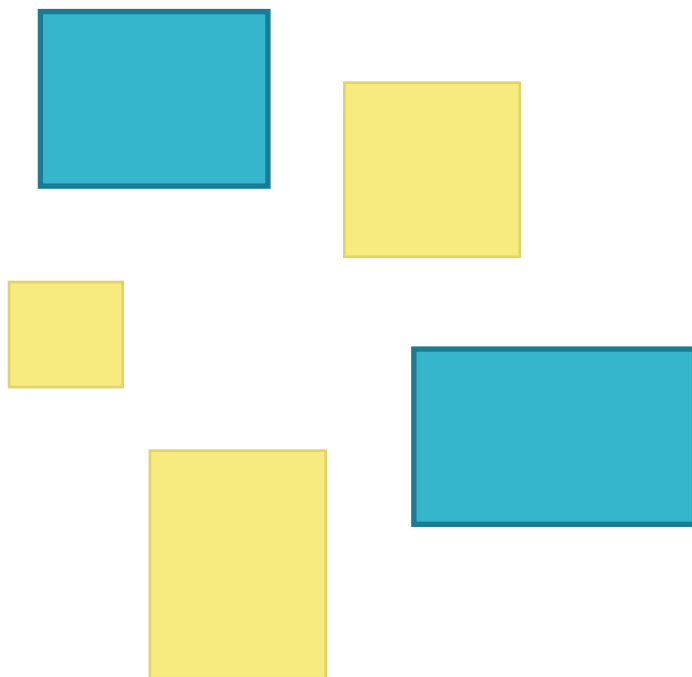


Let's consider **another criterion** we could use to classify these shapes.



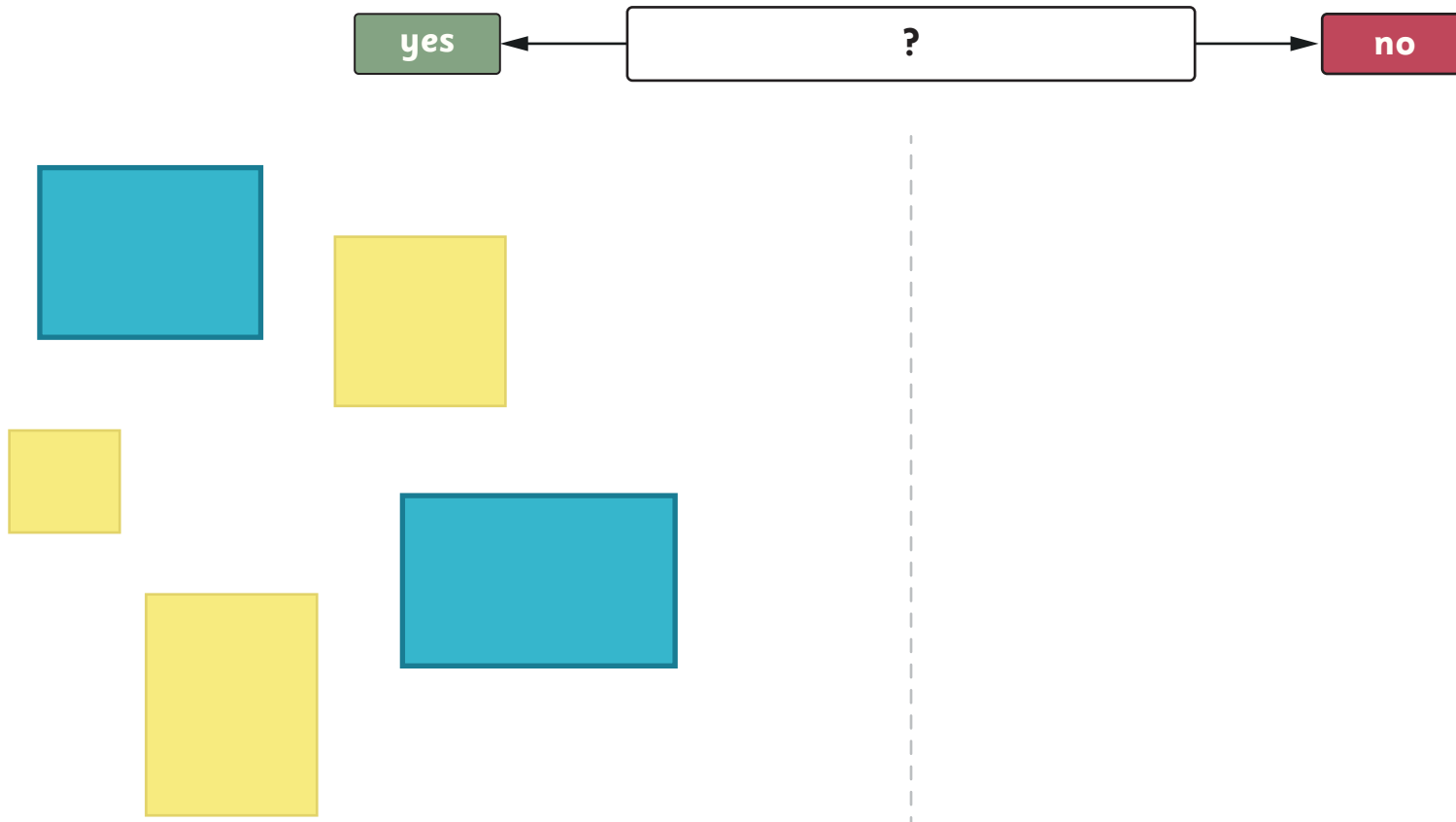


# Classification criteria



# Classification criteria activity

What **question** could you use to **split the leftover shapes** into **two more groups**? **Discuss** this question with your **learning partner**. Be ready to **share your feedback** with the class before the **answers are revealed**.



# Classification criteria activity

answers

square

yes

Are all the sides equal?

no

rectangle



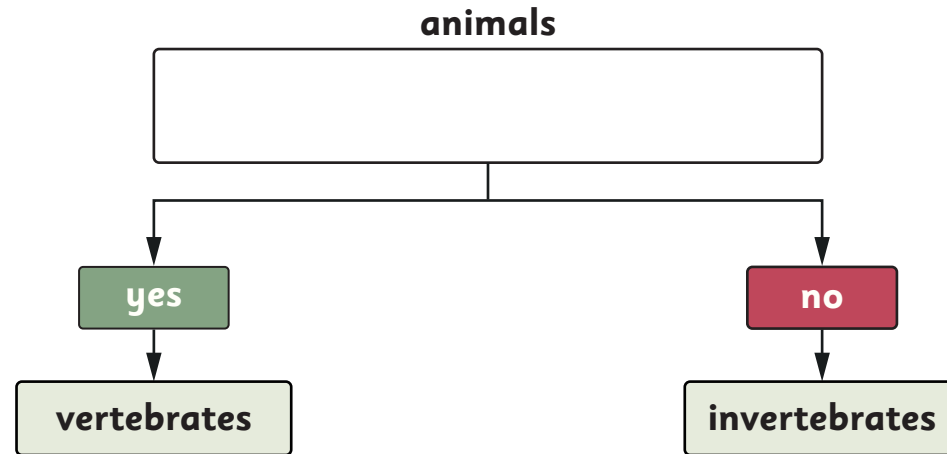
We have a **small square** and a **big square**, just like we get **big spiders** and **small spiders**. They still have the **same characteristics** that put them in the **same class**.





# Animal classification activity

Animals are **classified** into **two broad groups**, which are '**vertebrates**' and '**invertebrates**'.



**Discuss** the following questions with your **learning partner**.

- What **characteristic** splits all animals into these two groups?
- What question can we add to our **classification key**?

Be ready to **share your feedback** with the class before the **answers are revealed**.



# Animal classification activity

answers

17

## animals

Does the animal have a backbone  
or internal skeleton?

yes

vertebrates

no

invertebrates

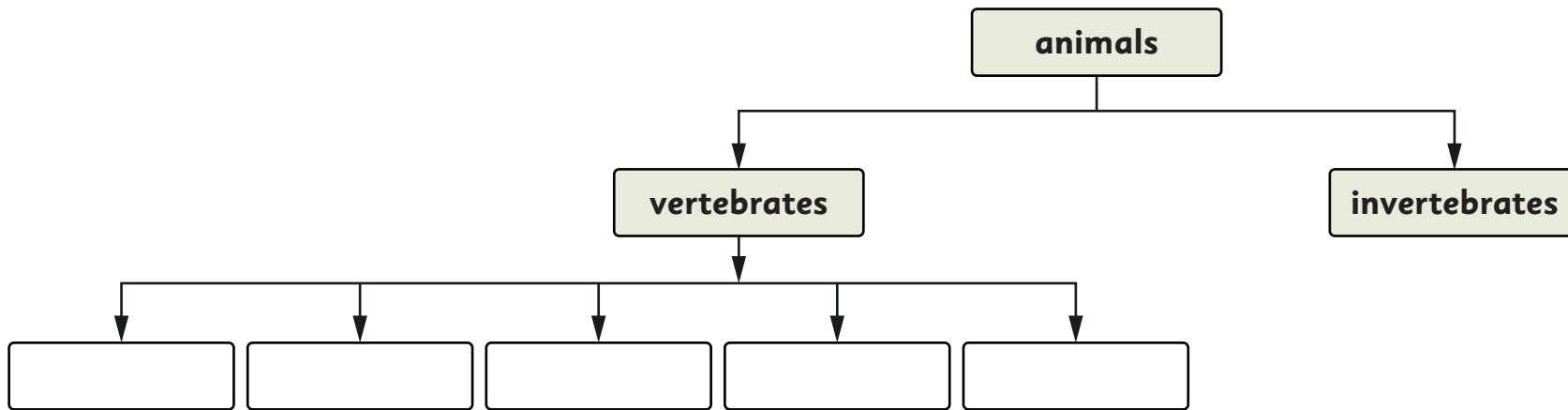


# Classifying vertebrates activity

We know from last lesson that **vertebrates** are **classified** into **five broad groups**.

Can you **name** them?

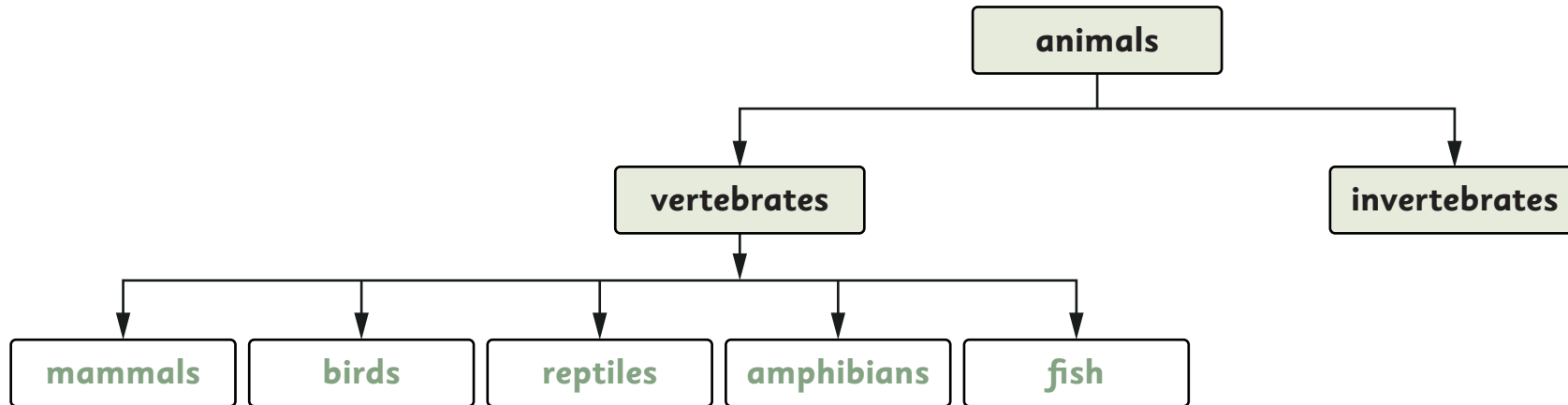
**Discuss** this question with your **learning partner**. Be ready to **share your feedback** with the class before the **answers are revealed**.





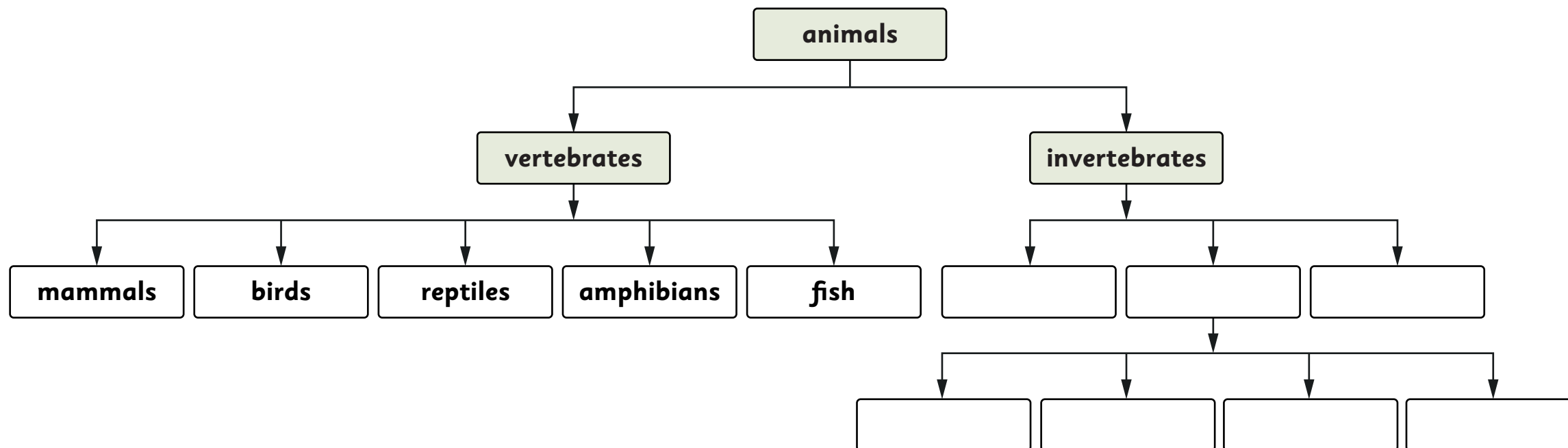
# Classifying vertebrates activity

answers



# Classifying invertebrates

We will now explore how **animals in the invertebrate group are classified.**



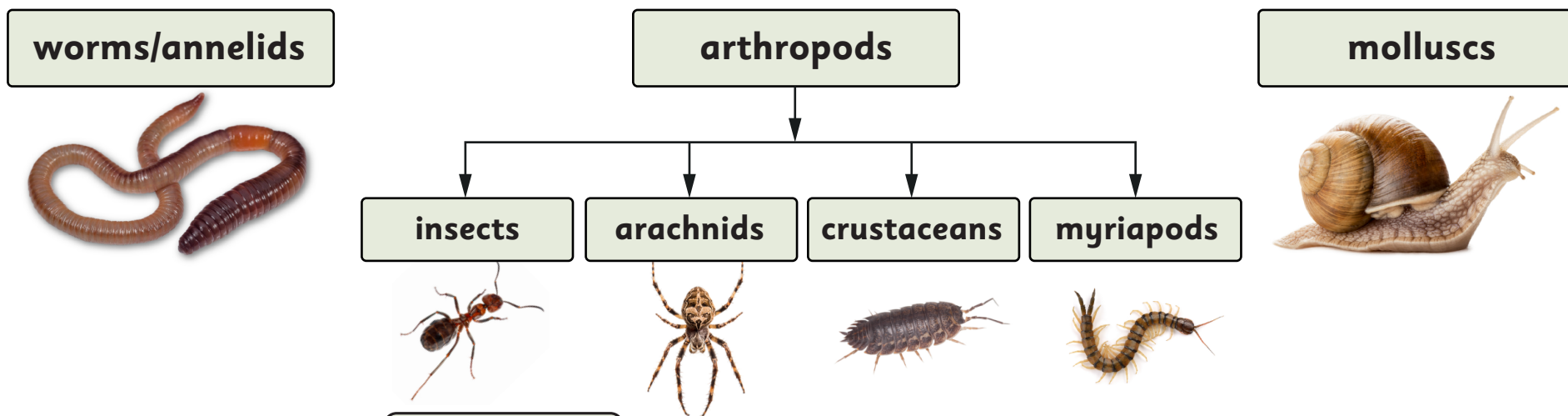
# Classifying invertebrates

**Invertebrate animals** can be classified into groups that include **annelids, arthropods (such as insects, arachnids, crustaceans, and myriapods), and molluscs**. To classify them further, we need to examine their **characteristics** closely.

What do we **need to know** about any invertebrate animals we might find in the **playground** before we begin to **classify** them further?

What **characteristics** can be used to group them?

**Discuss** these questions with your **learning partner**. Be ready to **share your feedback** with the class.



**Remember!**

Not all invertebrate groups are included in this lesson.





# Classifying invertebrate groups

First, we need to consider whether the invertebrate has an **exoskeleton** or a **soft body**.  
This splits the invertebrates into **two broad groups**.



# Classifying invertebrate groups

If the invertebrate has an **exoskeleton**, we then look at the **number of legs**. These invertebrates are called **arthropods**. We might also examine the number of parts in the body and the number of legs attached to each **segment**.

## insects

- six legs (may have wings)
- three body parts (head thorax and abdomen)



## arachnids

- eight legs
- two body parts (head and abdomen)



## crustaceans

- body split into segments
- most have ten legs
- woodlice have fourteen legs



## myriapods

- body segmented
- millipedes - two pairs of legs per segment
- centipedes - one pair of legs per segment



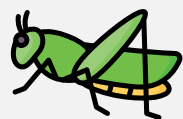
### New word alert!

**arthropod** – an invertebrate which has an exoskeleton and is characterised by a segmented body and jointed legs





# Word detective



**arthropod** – an invertebrate which has an exoskeleton, a segmented body and jointed legs

The word '**arthropod**' comes from Greek.



CVL



**arthr** ⊕ **o** ⊕ **pod** = **arthropod**  
 “joint” “foot”



Together, these word parts mean “**jointed foot**”. This is because arthropods have jointed legs.

**The joint** moves in a similar way to how your **elbows and knees** allow your **arms and legs** to bend.



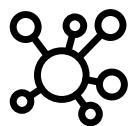


# Word detective



**myriapod** – any of various arthropods that have a long segmented body with numerous pairs of legs

Knowing that **‘pod’** means **‘foot’**, we can understand another scientific word.



**myria** + **pod** = **myriapod**  
 “many” “foot”



Together, these word parts mean **“many feet”**, and that’s exactly what these creatures have, **lots of legs!** **Centipedes** and **millipedes** are the most well-known myriapods.



# Classifying soft-bodied invertebrates

If the invertebrate has a **soft body**, we examine whether it has **segments** or a **shell**.

## worms/annelids

- segmented body



## molluscs

- no segments
- soft body usually covered by a hard shell



### Did you know?

The scientific name for a snail is a **gastropod**. What do you think the terms **gastro + pod mean**? What does this tell us about the snail?



# Stop and jot 1



Use the table on your stop and jot 1 worksheet to **classify invertebrates**.

Be ready to **share your feedback** with the class before the **answers are revealed**.

## Stop and jot 1

What **criteria** are used to **classify invertebrate groups**?

soft body		exoskeleton			
annelids worms	molluscs slugs and snails	insect fly ant beetle	arachnid spider scorpion	crustacean crab woodlouse	myriapod centipede millipede



# Stop and jot 1

## answers

What **features** should we look for to **classify invertebrates**?

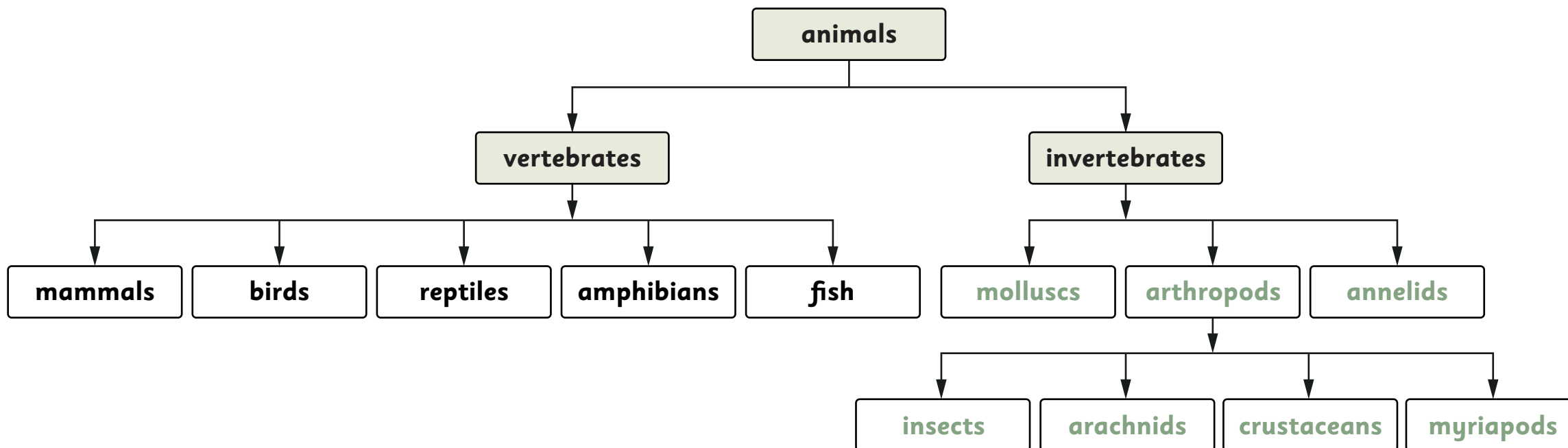
soft body		exoskeleton			
annelids worms	molluscs slugs and snails	insect fly ant beetle	arachnid spider scorpion	crustacean crab woodlouse	myriapod centipede millipede
segmented body	soft body often with a shell	six legs  three body parts	eight legs  two body parts	mostly ten legs  some have fourteen legs  segmented body	many legs  segmented body  one or two pairs of legs per segment



# Invertebrate classification key

answers

We will now explore how the **invertebrate group** is classified.



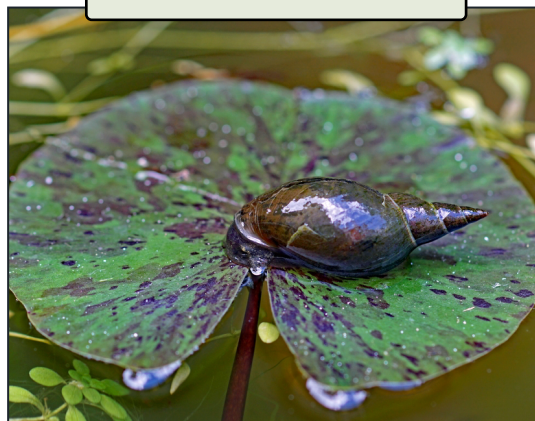
# What type of invertebrate am I?

Use what you have learnt to **classify** these **pond invertebrates**. **Discuss** this with your **learning partner**. Be ready to **share your feedback** with the class before the **answers are revealed**.

pond leech



pond snail



water beetle



water spider





# What type of invertebrate am I?

answers

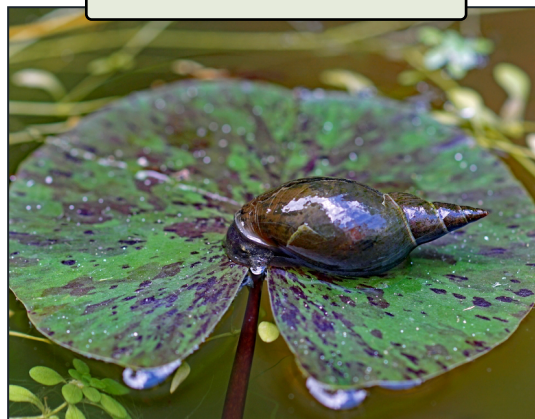


pond leech



annelid

pond snail



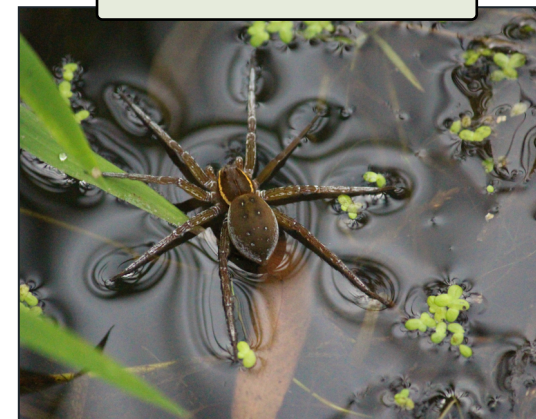
mollusc

water beetle



insect

water spider



arachnid





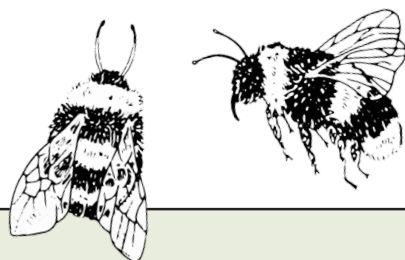
# Activity



Identifying & classifying



Recording data



I would like you to **observe and classify** the **invertebrate animals** that you can find within your **school grounds**. First, you will need to go out **exploring to see what you can find!**

To ensure that any **animals** you find are **not harmed**, observe them from a distance without handling. Get close-up **photos**, or make **detailed sketches of the invertebrate animals** on your activity worksheet if the animals don't move too fast! Look at the **example** on the following slide, which shows how you could use your worksheet.

It isn't always possible to get outside to make **observations**. **Scientists** often use **detailed photographs to make observations to classify animals**.

If you can't get outside, use one of the **picture packs** which show detailed photos of pond and playground animals. You can then **annotate the images** with the **characteristic features** that you use to classify each animal.

## Activity – animal observation table ★★

animal name	classification	animal name	classification
detailed sketch with annotations		detailed sketch with annotations	

## Activity – animal observation table ★

photo or detailed sketch	observed characteristics	animal name	classification

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# Activity




Identifying &  
classifying



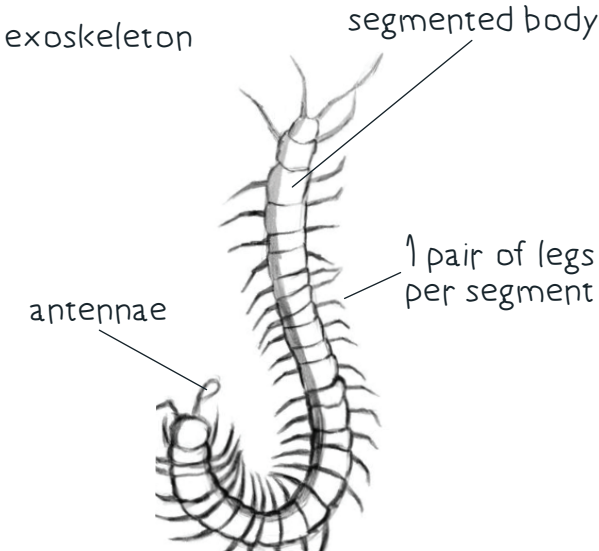
Recording data

Use your activity worksheet to **record your sketches and observations**, as shown below.

## Activity – animal observation table ★

photo or detailed sketch	observed characteristics
	exoskeleton lots of legs antennae segmented body

## Activity – animal observation table ★★

animal name	classification	animal name	classification
centipede	myriapod		
<b>detailed sketch with annotations</b> 		<b>detailed sketch with annotations</b>	

# Let's discuss



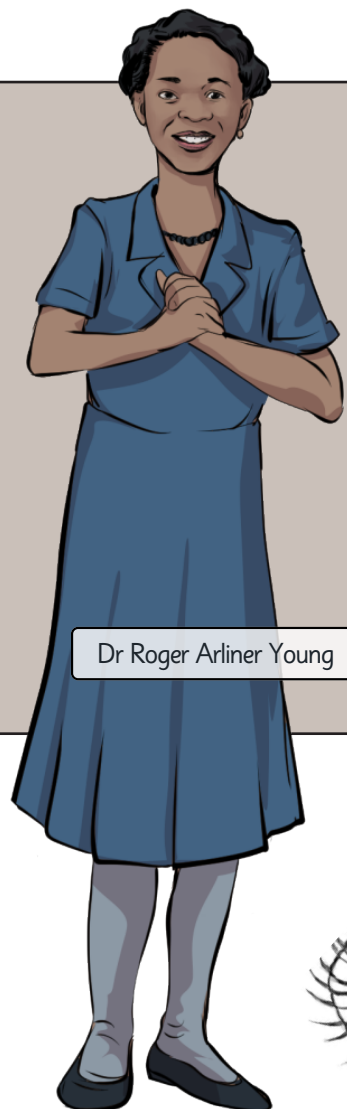
Identifying & classifying



Recording data



Interpreting & communicating results



Dr Roger Arliner Young

Take a moment to **review the observations** made by other students in your table group. Scientists not only learn by making their own observations and drawings, but also by **studying the work of other scientists**.

**Discuss** the following questions with your **table group**.

- Can you find a sketch that has been **clearly annotated**, showing its characteristic features?
  - Have you spotted a really **detailed sketch** that shows features you didn't notice?
  - Did you agree with the **classification** for the invertebrates you found?

Be ready to **share your feedback** with the class.



**Use the following sentence starters to help you.**

"This sketch is clearly annotated because it shows..."

"One detailed feature I noticed in this sketch that I hadn't seen before is..."

"I agreed/disagreed with the classification because..."





# Challenge

The **duck-billed platypus** is a curious creature that is native to **Australia**. It has **fur, a beak, webbed feet**, and it **lays eggs**!

It looks similar to an **otter**. Look carefully at the **features**.



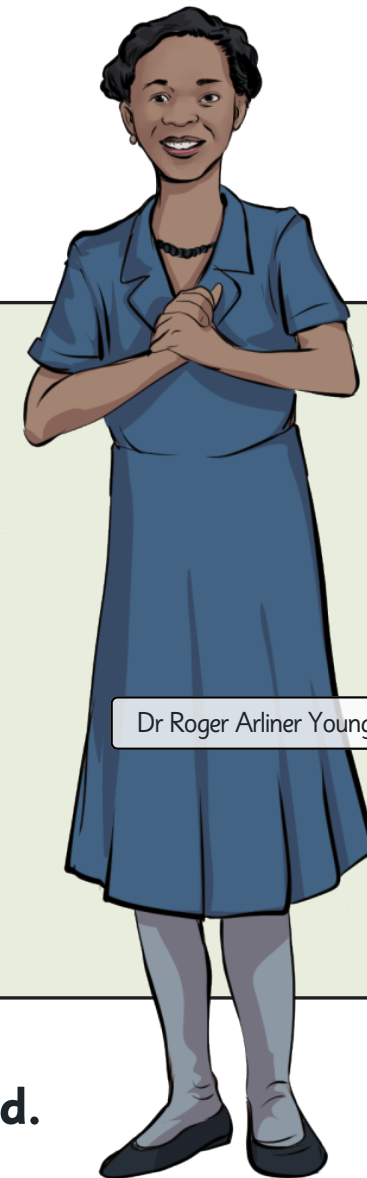
What is **the same**?

What is **different**?



Which **vertebrate group** so you think the **platypus** belongs to? **Explain** why.

Be ready to **share your feedback** with the class before the **answer is revealed**.





# Challenge

## answers

The **duck-billed platypus** is a curious creature that is native to **Australia**. It has **fur, a beak, webbed feet**, and it **lays eggs**!

It looks similar to an **otter**. Look carefully at the **features**.



duck-billed platypus

What is **the same**?

What is **different**?



otter

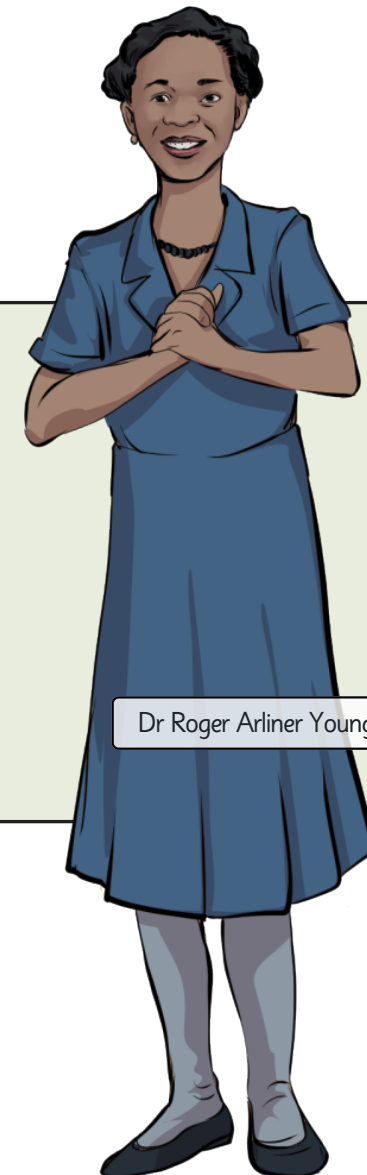
Which **vertebrate group** so you think the **platypus** belongs to? **Explain** why.

Both animals have **fur** and a **strong tail for swimming in water**. The platypus has a **beak** and **webbed feet** like a **duck**. The otter has **whiskers, teeth** and **claws**.

The platypus would be a **mammal** because it has **fur**. It has a **beak** and **lays eggs like a bird** but it does not have **feathers**.



Dr Rosalind Franklin



Dr Roger Arliner Young