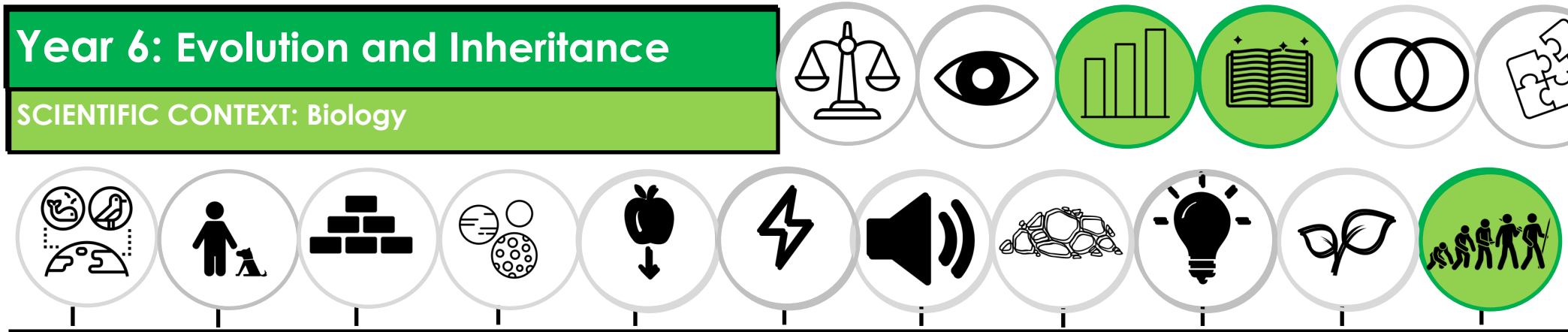
Year 6: Evolution and Inheritance

SCIENTIFIC CONTEXT: Biology



KEY VOCABULARY:

Fossils	A fossil is the remains or traces of prehistoric life.
Species	Species refers to a group of similar organisms that are able to reproduce.
Inherited	Inheritance is the process by which genetic information is passed on from parent to child.
Characteristics	Appearance that makes an individual or a group different from others
Offspring	*Offspring* are the young creation of living organisms
Sexual reproduction	Sexual reproduction occurs when the sperm from the male parent fertilizes an egg from the female parent, producing an offspring that is genetically different from both parents
Suited	Having the qualities that are right, needed, or appropriate for something
Adapted	Adaptation is the physical or behavioural characteristic of an organism that helps an organism to survive better in the surrounding environment.
Environment	'Environment' simply means 'surroundings'
Variations	Variation refers to the difference between two individuals of a species.

As Scientists we will...

Pupils should be taught to:

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago,
- recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents,
- identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

Working scientifically:

Pupils should be taught to:

- Identify scientific evidence that has been used to support or refute ideas or arguments,
- report and present findings from enquiries.

Notable Scientist: Charles Darwin

Key Questions:

1) **Can you give an example of how a living thing has changed over time?**
2) **What information can fossils provide?**
3) **How do animals adapt to suit their environment?**
4) **Describe inheritance and variation.**

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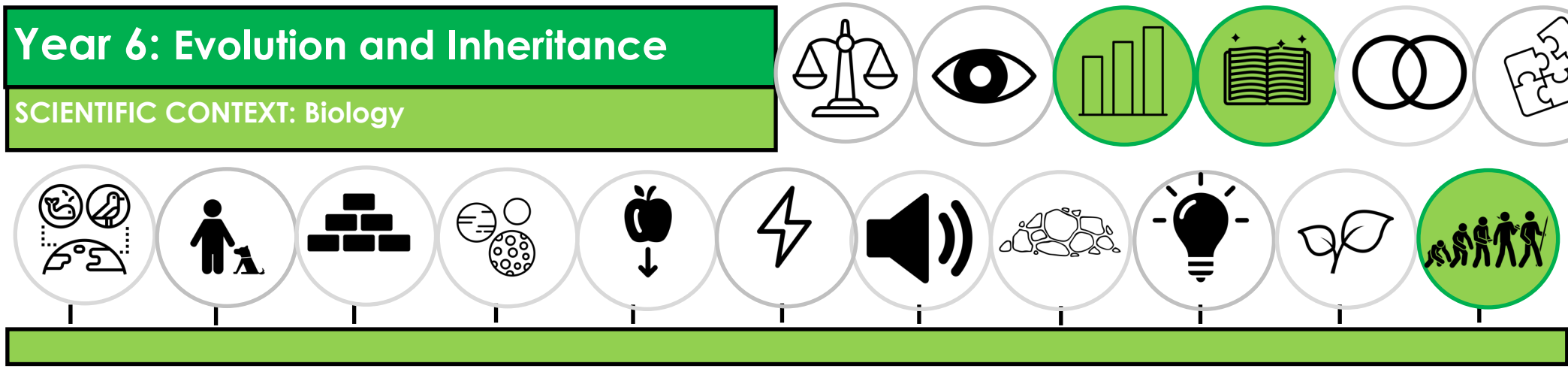

What I need to know:

All living things have offspring of the same kind, as features in the offspring are inherited from the parents. Due to sexual reproduction, the offspring are not identical to their parents and vary from each other. Plants and animals have characteristics that make them suited (adapted) to their environment. If the environment changes rapidly, some variations of a species may not suit the new environment and will die. If the environment changes slowly, animals and plants with variations that are best suited survive in greater numbers to reproduce and pass their characteristics on to their young. Over time, these inherited characteristics become more dominant within the population. Over a very long period of time, these characteristics may be so different to how they were originally that a new species is created. This is evolution. Fossils give us evidence of what lived on the Earth millions of year ago and provide evidence to support the theory of evolution. More recently, scientists such as Darwin and Wallace observed how living things adapt to different environments to become distinct varieties with their own characteristics.

Opportunities for science capital

Book Mary Anning Talk & Walk session at Lyme Regis museum Pupils will learn about the remarkable life and discoveries of Mary Anning and the amazing geology of the Jurassic Coast. Find out about Ammonites, Ichthyosaurs, Plesiosaurs, how these creatures evolved and interacted, how fossils form, and why we find so many in the rocks and clay around Lyme Regis.

Part of science capital includes scientific media consumption- documentaries, reports etc. Here are links that provide daily science news for children. Checking in on these every now and then would be beneficial to help children see science in the wider world.

https://www.sciencenewsforstudents.org/

https://www.sciencejournalforkids.org/

Assessment:

By the end of this unit of work, pupils should be able to give examples of how living things have changed over time and recognise that fossils provide information about living things that inhabited the Earth millions of years ago. They should be able to recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. They should be able to describe and give examples of how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Pupils should be aware of Charles Darwin and be able to discuss his contributions to the world of science.

Working scientifically:

By the end of this unit of work, pupils should be able to report and present findings from enquiries and identify scientific evidence that has been used to support or refute ideas or arguments,

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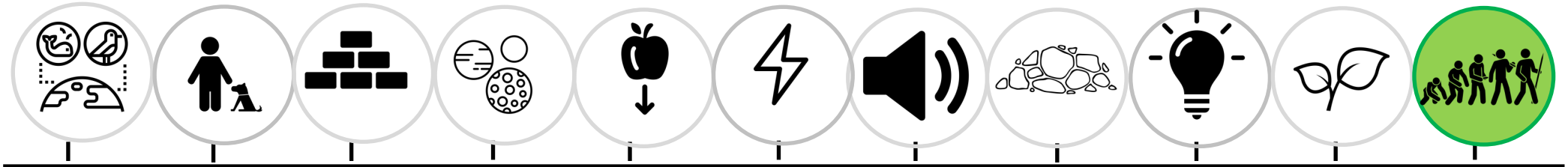

Theme 1: Fossils

Starter

Nando's takeaway chilli challenge recapping prior knowledge relating to evolution and inheritance.

Complete KWL grid.

Main

Substantive knowledge

Work through activities and visuals on fossils: https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00351/activities/starter

Disciplinary knowledge

Research enquiry

Working scientifically objectives: Identifying scientific evidence that has been used to support or refute ideas or arguments

Activity *Today we are going to be palaeontologists.*

Show a picture of a fossilised skeleton/creature and discuss the children's ideas about fossils, what it was, what it ate, where it lived etc. Discuss strong/weak evidence e.g. strong evidence that has skeleton/teeth etc, place where fossil was found suggests habitat, similarities with modern creatures suggest colour etc.

Provide children with photos or real/resin fossils (trilobite, ammonite, ichthyosaurus etc, plus any found locally or linked/displayed at local museums).

Plenary / assessment

Ask them to use the fossils and their own research to develop ideas about the creatures e.g. labelled drawing with size, possible appearance, diet, habitat, what other fossils could exist eg what prints could be left behind. See TAPS full plan: Fossil habitats

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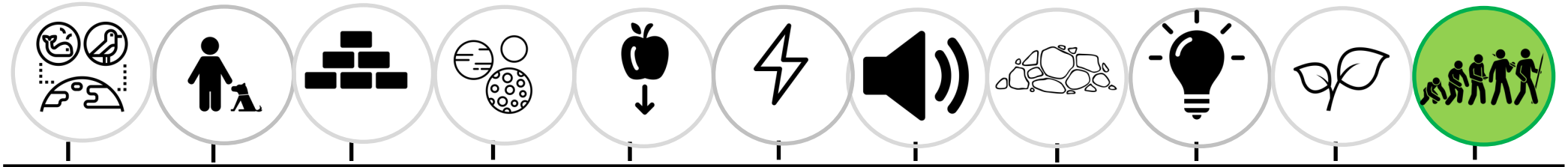

Theme 2: Evolution and Natural Selection

Starter

Recap– label a fossil with possibilities of what we can learn from it e.g. teeth.

Main

Substantive knowledge:

Work through activities on tigtag- https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00351/activities/main

Disciplinary knowledge:

Working scientifically objectives: identifying scientific evidence that has been used to support or refute ideas or arguments

See Battle of the Beaks experiment: https://www.stokebishop.bristol.sch.uk/wp-content/uploads/2020/07/Innovators-Battle-of-the-Beaks-Science-1.pdf

Discuss how the evidence from experiment supports the idea of evolution and natural selection.

Plenary / assessment

Recap– Explorify, Odd One Out:

https://explorify.uk/en/activities/odd-one-out/perfect-pinchers

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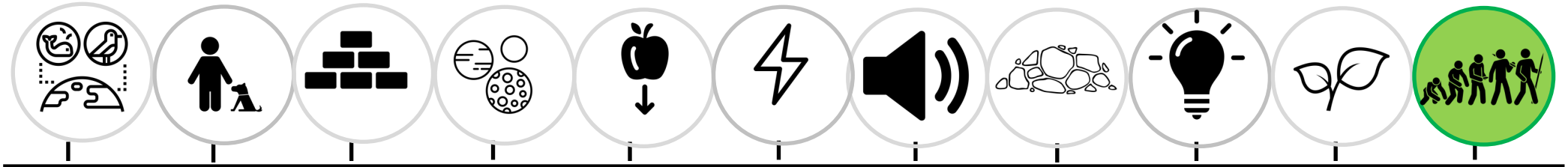

Theme 3: Adaptation

Starter

Recap Y2 objective: Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other (Y2 - Living things and their habitats).

E.g. why is a polar bear suited to his habitat?

Main

Substantive knowledge:

Work through activities on tigtag: https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00347/activities/main

Reinforce learning with modelling activity: https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00351/activities/practical/ACTVTY00643

Disciplinary knowledge:

Research

Working scientifically objectives: reporting and presenting findings from enquiries

Children choose an animal and research its adaptations e.g. camel, polar bear. Present findings to class in presentation.

Plenary / assessment

Adaptation quiz: https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00347/quiz

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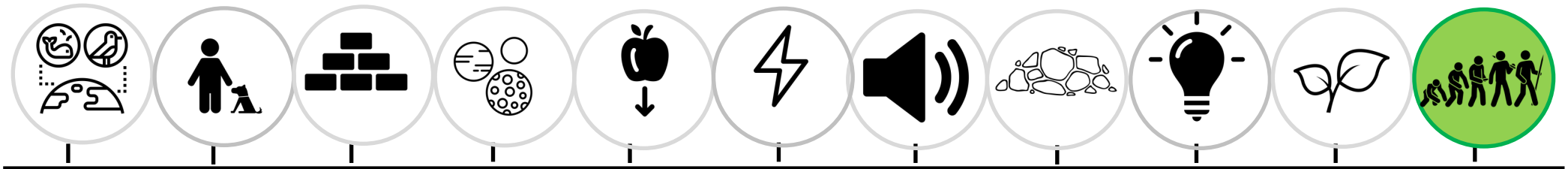

Theme 4: Variations

Starter

Recap– beat the clock

Main

Substantive knowledge:

Work through activities on: https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00329/activities/main

Plenary / assessment

Tell the children that they are now going to create a pair of imaginary creatures and their offspring. These creatures are the same species, so they will need to share some specific features, but there may be variation in their colour, shape, length and size etc.

Give each child a sheet of paper and colouring pencils/pens. Ask them to annotate the illustration to describe the features and explain the genetic inheritance. For example, if both parents have green fur, the offspring may have inherited green fur from them, or it may have pink fur, inherited from a grandparent. This would need to be explained on the illustration.

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Theme 5: Charles Darwin

Starter

What if…

https://explorify.uk/en/activities/what-if/all-humans-looked-the-same

Main

Substantive knowledge:

Research Charles Darwin and his contributions to science. Present findings using double page spread and key subheadings. See below:

I am looking for:

- Title
- Subheadings
- Paragraphs
- Clear organisation
- Effective, careful presentation
- Scientific vocabulary
- Images and captions
- Fact splats

Use these headings to structure your spread.

Charles Darwin
Russell Wallace
Natural Selection
Theory of Evolution
Galapagos Islands
HMS Beagle
Travel Writing

Plenary / assessment

End of topic quiz.

Complete KWL grid