CYCLES IN NATURE

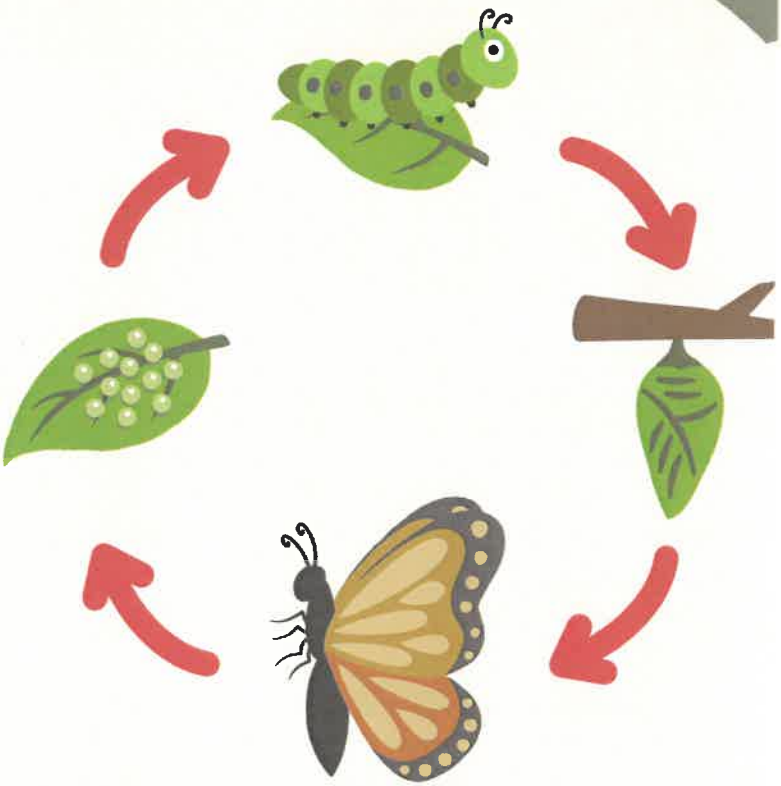
CONNECTING MATH AND SCIENCE CONCEPTS

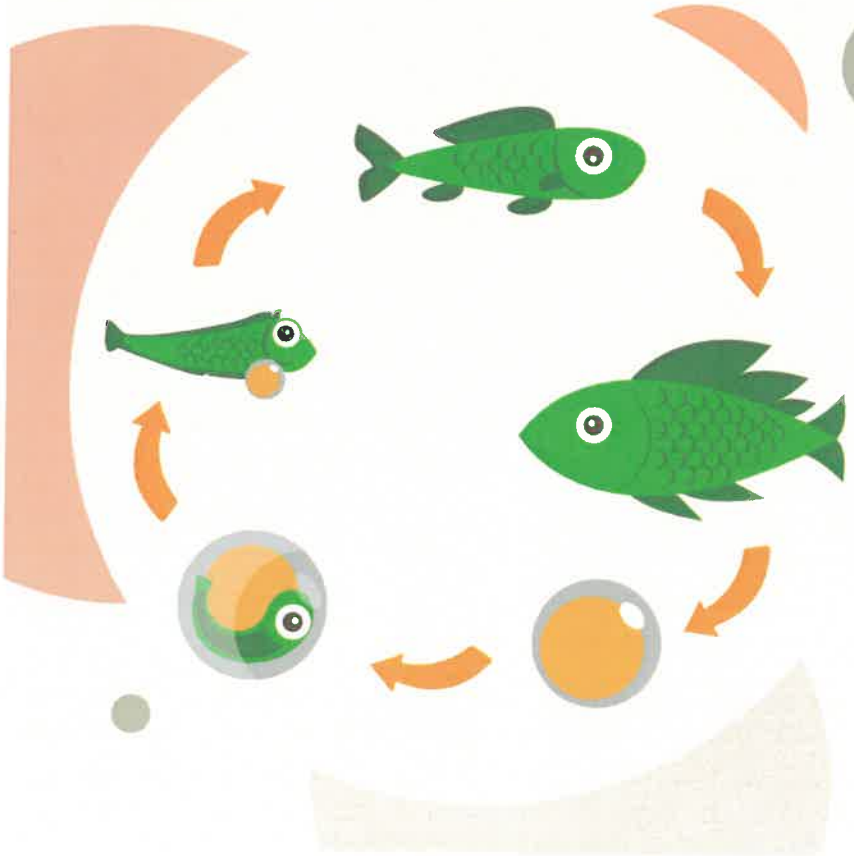
EXPLORING CYCLES IN NATURE

LIFE CYCLES OF LIVING THINGS ARE PATTERNS

Exploring life cycles is a perfect way to bridge math and science concepts.

In science, students investigate the stages of growth and change in living things—observing patterns, sequencing events, and understanding biological processes. In math, these same observations can be quantified and analyzed: measuring growth rates, calculating averages, creating timelines, and representing data with charts or graphs.





CONNECTING THE DOTS

By combining these skills, learners see how numbers can tell the story of life, and how scientific inquiry can be deepened through mathematical reasoning.

This integrated approach not only builds knowledge but also fosters curiosity and critical thinking.

🐸 Life Cycle of a Frog – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the four stages of a frog's life cycle
- Describe how frogs change at each stage
- Put the stages in the correct order
- Understand that frogs undergo metamorphosis (major body changes)

🧠 Key Vocabulary

Life cycle, egg, tadpole, froglet, adult frog, metamorphosis

🐸 Frog Life Cycle Stages

1. **Egg** – Frogs lay eggs in water, often in clusters called frogspawn.
2. **Tadpole** – Tadpoles hatch from eggs, live in water, have tails and gills, and no legs.
3. **Froglet** – Tadpoles grow legs, develop lungs, and their tails shrink.
4. **Adult Frog** – Fully grown frogs have no tail, live on land and in water, and can lay eggs.

🚀 Lesson Activities

- **Introduction:** Discuss what students already know about frogs; show a picture or video.
- **Teaching:** Explain each life cycle stage using visuals or a diagram.
- **Guided Practice:** Students sequence pictures of the frog life cycle.
- **Independent Work:** Students complete a worksheet, draw the stages, or make a simple craft.

✅ Assessment

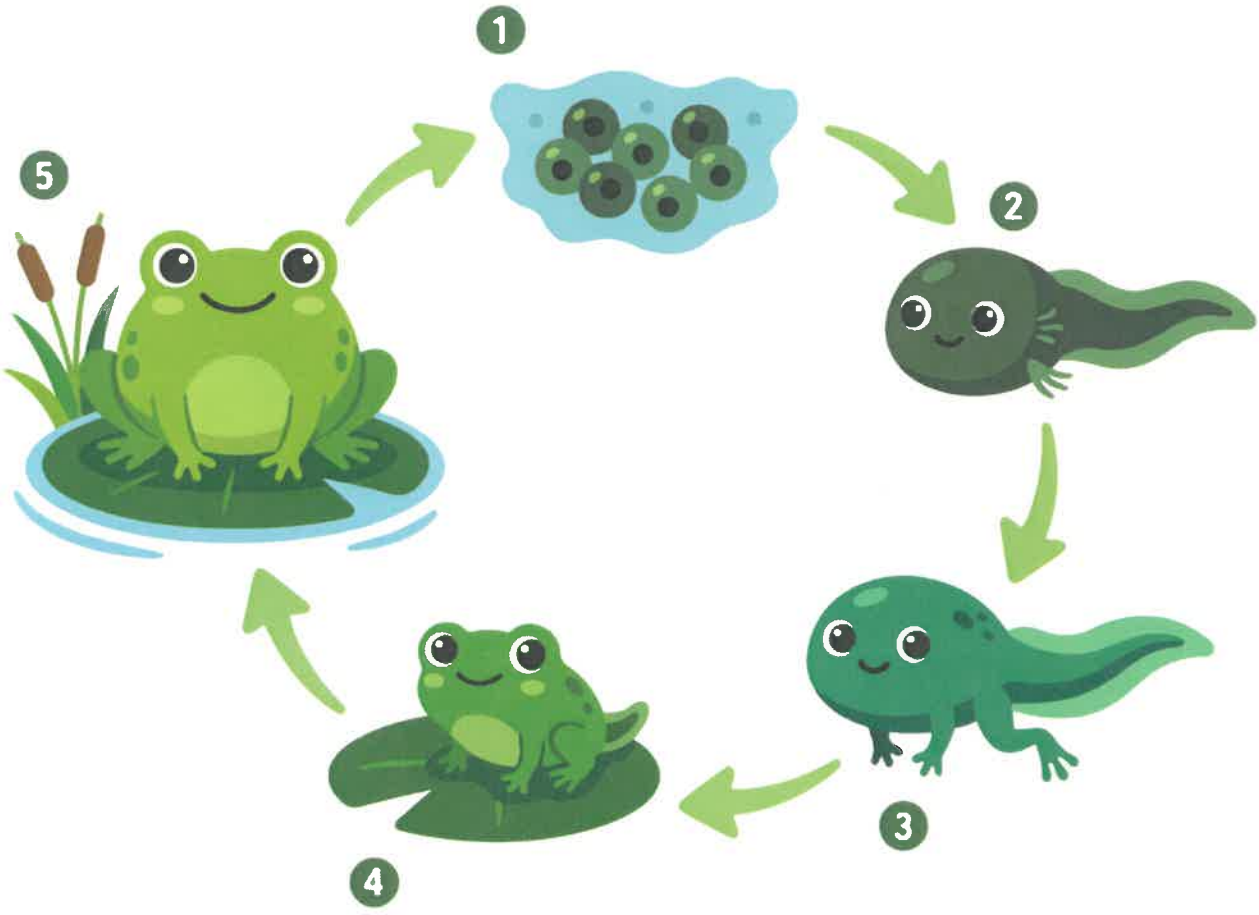
- Students explain one stage of the life cycle
- Simple drawing or labeling activity to check understanding

🔄 Closure

Review the stages and reinforce that frogs change throughout their lives. Emphasize the term metamorphosis.

🌟 Extensions & Supports

- Compare frog life cycle with other animals (e.g., butterflies)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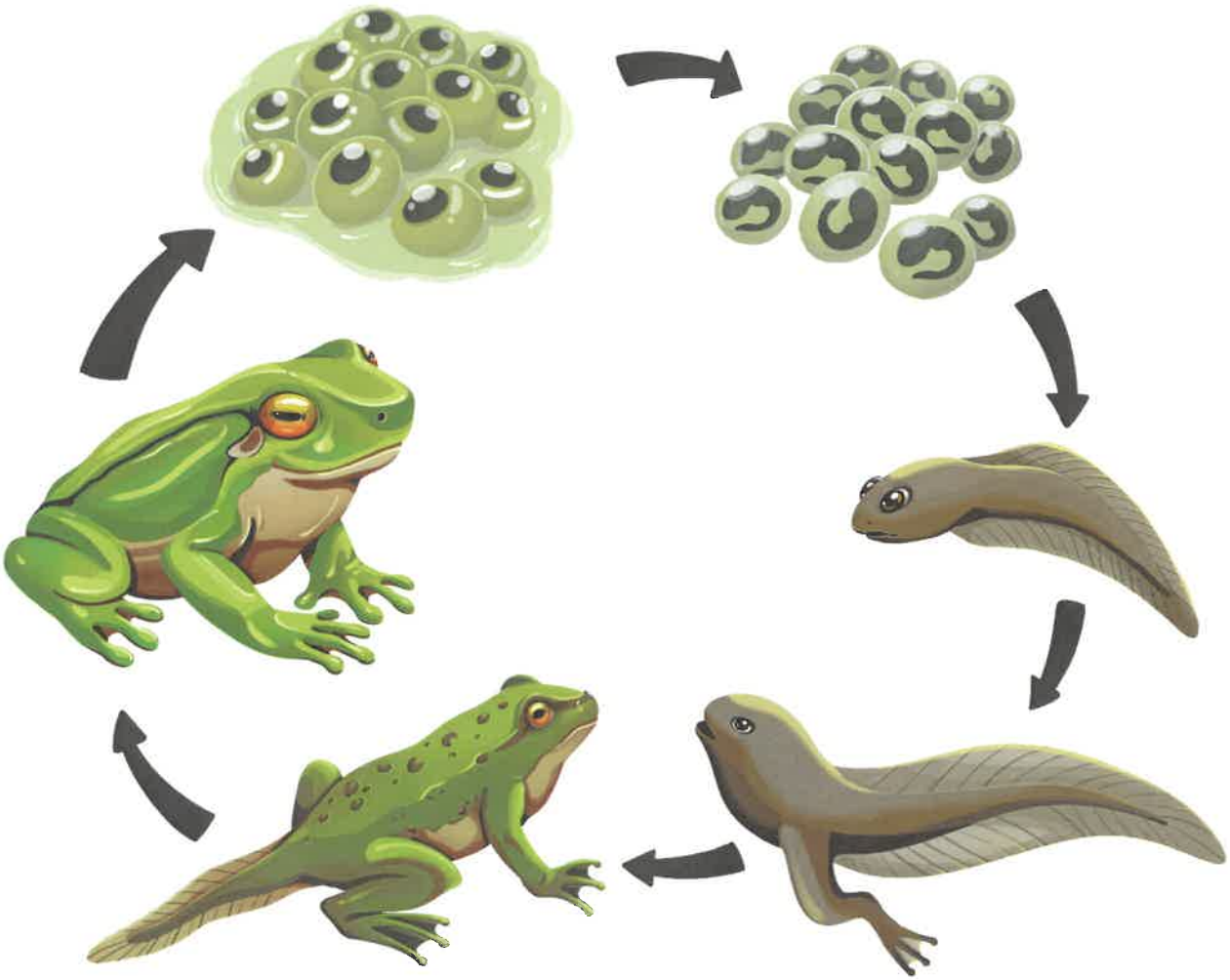


🦋 Life Cycle of a Butterfly – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the four stages of a butterfly's life cycle
- Describe the changes at each stage
- Sequence the stages correctly
- Understand that butterflies undergo metamorphosis

🧠 Key Vocabulary

Life cycle, egg, larva (caterpillar), pupa (chrysalis), adult butterfly, metamorphosis

🦋 Butterfly Life Cycle Stages

1. **Egg** – Butterflies lay tiny eggs on leaves.
2. **Larva (Caterpillar)** – The egg hatches into a caterpillar that eats leaves and grows quickly.
3. **Pupa (Chrysalis)** – The caterpillar forms a chrysalis where it changes inside.
4. **Adult Butterfly** – A fully formed butterfly emerges, flies, and lays eggs to start the cycle again.

🚀 Lesson Activities

- **Introduction:** Ask students what they know about butterflies; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange pictures of the butterfly life cycle in order.
- **Independent Work:** Students complete a worksheet, draw the stages, or create a simple craft.

✅ Assessment

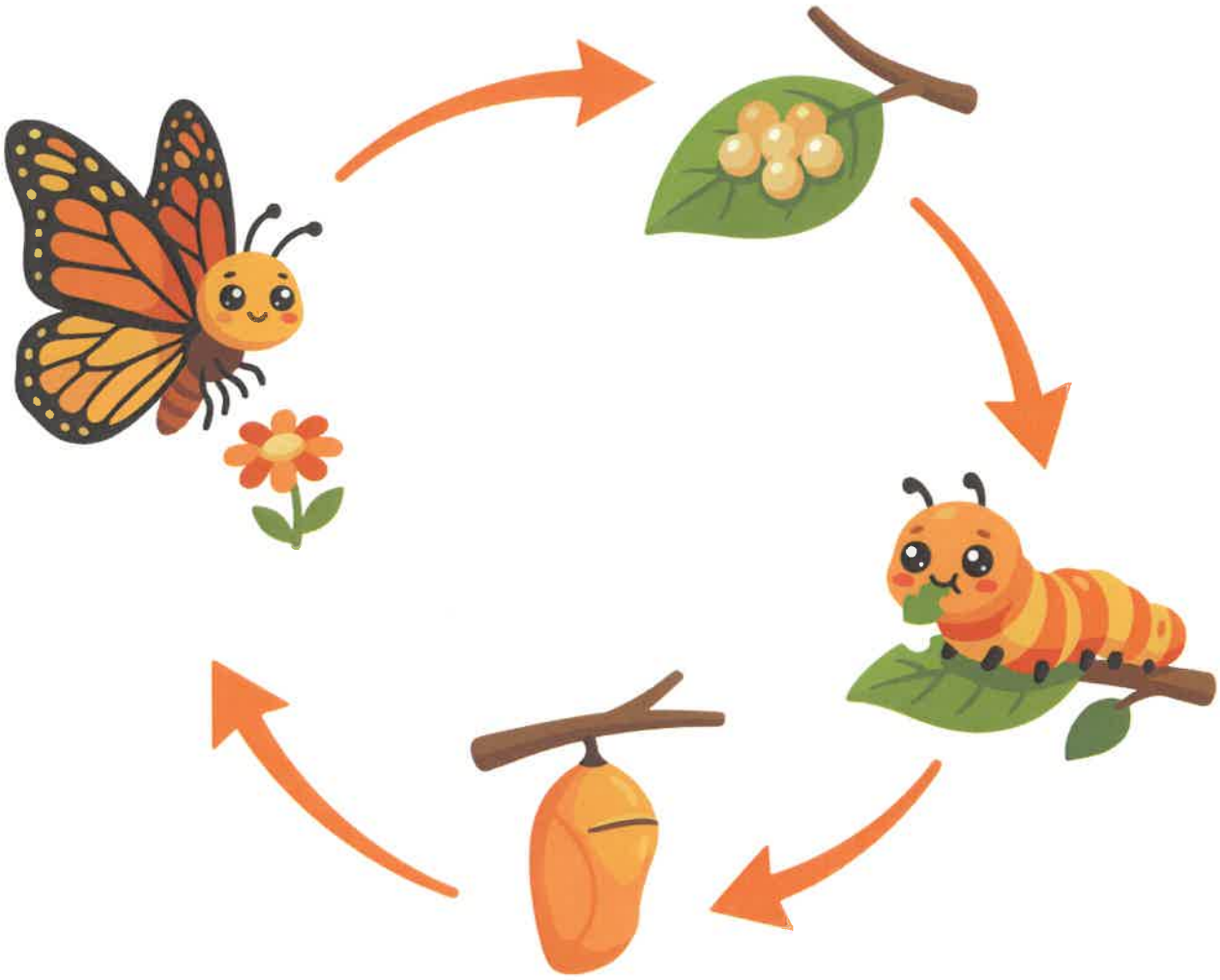
- Students describe or name one stage of the life cycle
- Drawing or labeling activity to demonstrate understanding

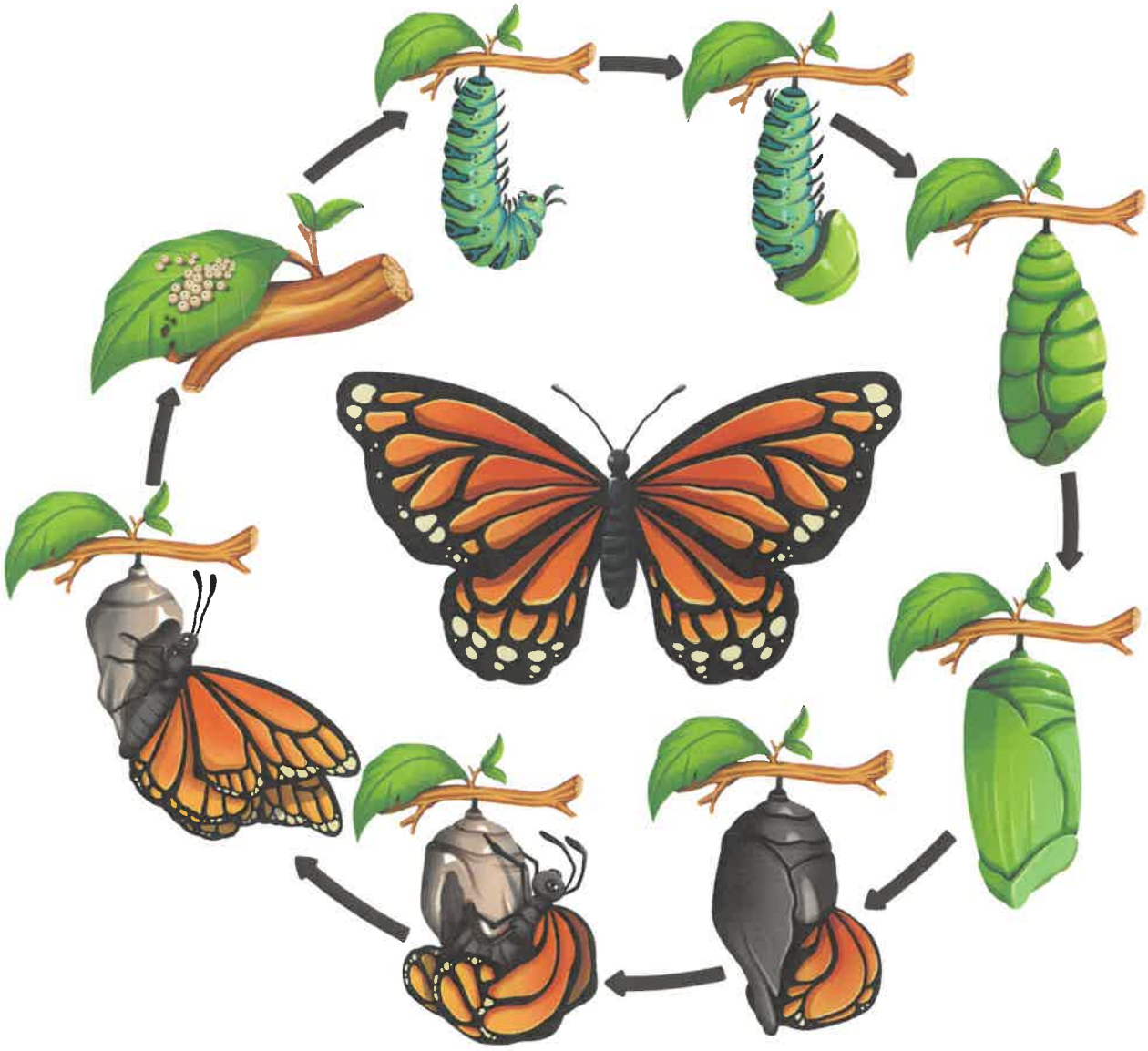
🔄 Closure

Review the stages and emphasize that butterflies change dramatically during their life cycle. Reinforce the idea of metamorphosis.

🌟 Extensions & Supports

- Compare butterfly and frog life cycles





🐟 Life Cycle of a Salmon – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a salmon's life cycle
- Describe how salmon change as they grow
- Sequence the stages in order
- Understand that salmon migrate (travel) between rivers and the ocean

🧠 Key Vocabulary

Life cycle, egg, alevin, fry, smolt, adult salmon, migration

🐟 Salmon Life Cycle Stages

1. **Egg** – Salmon eggs are laid in freshwater rivers and streams. They are protected in gravel nests.
2. **Alevin** – The eggs hatch into alevins, which stay hidden in the gravel and live off a yolk sac for food.
3. **Fry** – Young salmon leave the gravel, begin swimming, and start feeding on small organisms.
4. **Smolt** – As they grow, salmon develop the ability to live in saltwater and begin their journey to the ocean.
5. **Adult Salmon** – Fully grown salmon live in the ocean.
6. **Spawn** - When it is time to reproduce, they migrate back to their birthplace in freshwater to lay eggs and start the cycle again.

🚀 Lesson Activities

- **Introduction:** Ask students if they have seen salmon or heard about salmon swimming upstream; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange the life cycle stages in order.
- **Independent Work:** Students draw, label, or complete a worksheet about the stages.

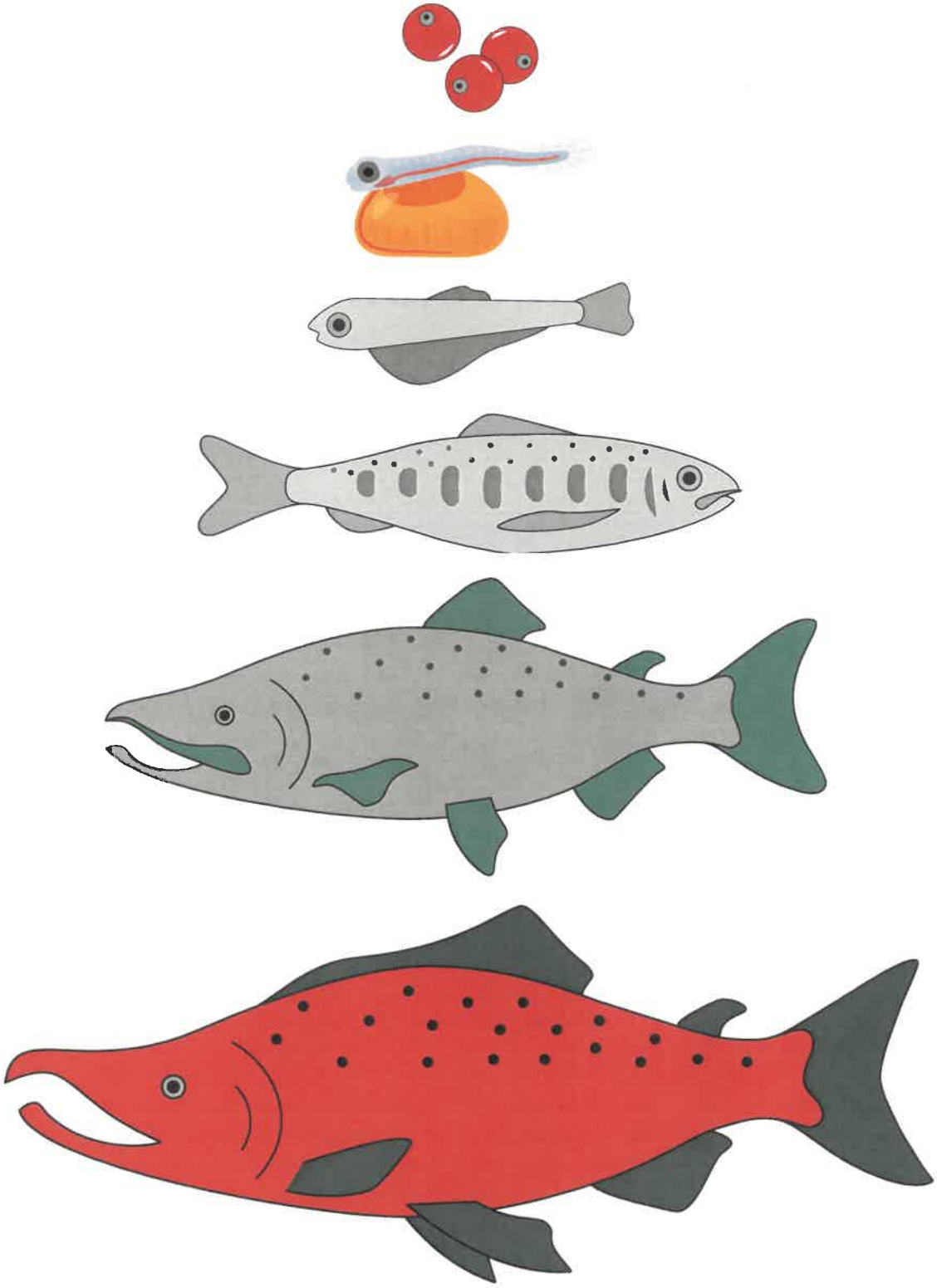
🔄 Closure

Review the stages and highlight the salmon's journey between river and ocean. Emphasize the idea of migration.

🌟 Extensions & Supports

- Discuss salmon in local ecosystems (especially in BC)

Salmon Life Cycle



🐞 Life Cycle of a Ladybug – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the four stages of a ladybug's life cycle
- Describe the changes at each stage
- Sequence the stages correctly
- Understand that ladybugs undergo metamorphosis

🧠 Key Vocabulary

Life cycle, egg, larva, pupa, adult ladybug, metamorphosis

🐞 Ladybug Life Cycle Stages

1. **Egg** – Ladybugs lay tiny yellow eggs on leaves, often near aphids (their food).
2. **Larva** – The eggs hatch into larvae that look long and spiky; they eat lots of insects and grow quickly.
3. **Pupa** – The larva attaches to a surface and forms a pupa, where it changes inside.
4. **Adult Ladybug** – A fully formed ladybug emerges with wings and spots, ready to eat and lay eggs.

🚀 Lesson Activities

- **Introduction:** Ask students what they know about ladybugs; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or a diagram.
- **Guided Practice:** Students arrange pictures of the life cycle in order.
- **Independent Work:** Students complete a worksheet, draw the stages, or create a simple craft.

✅ Assessment

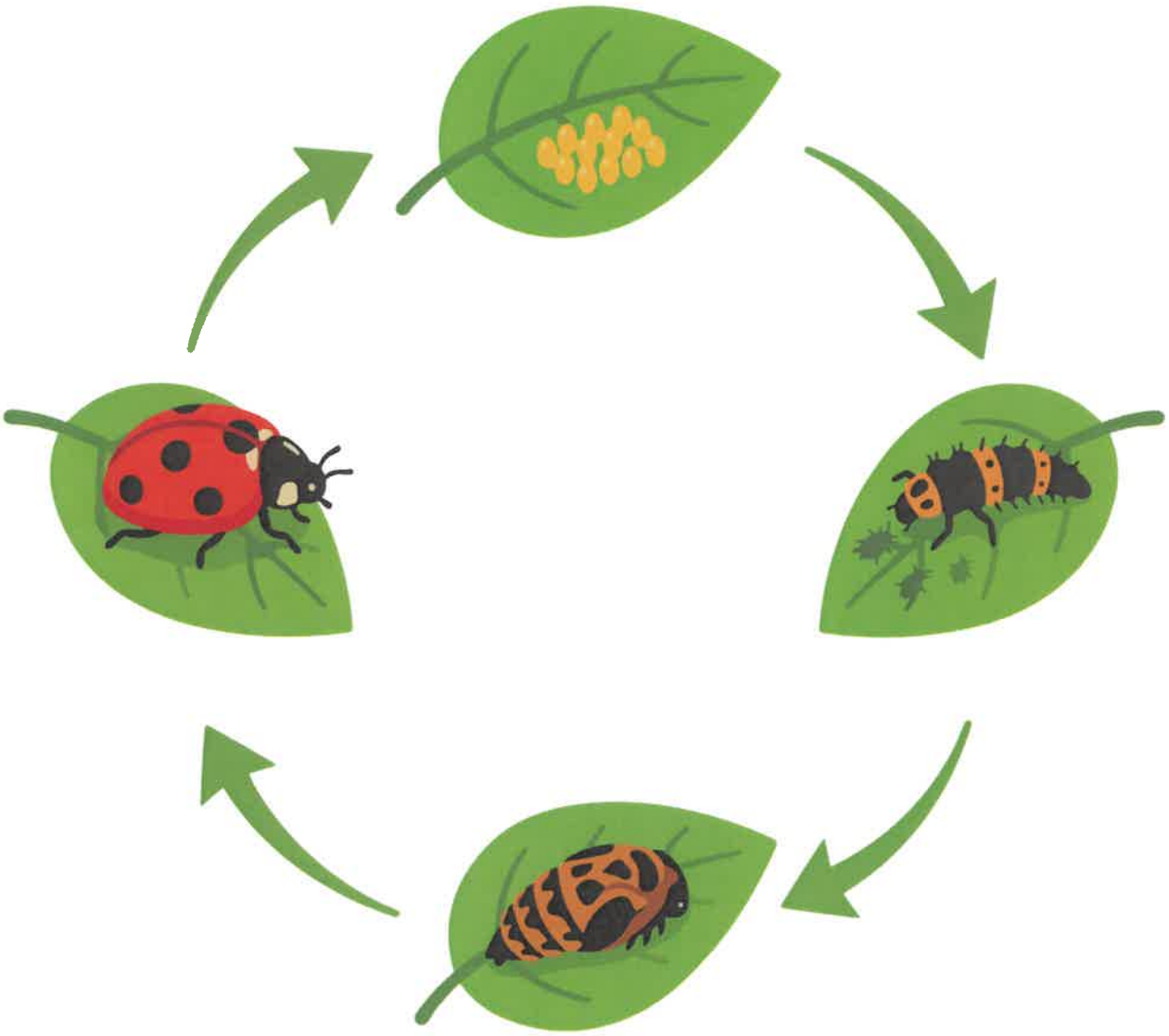
- Students explain or name one stage of the life cycle
- Drawing or labeling activity to show understanding

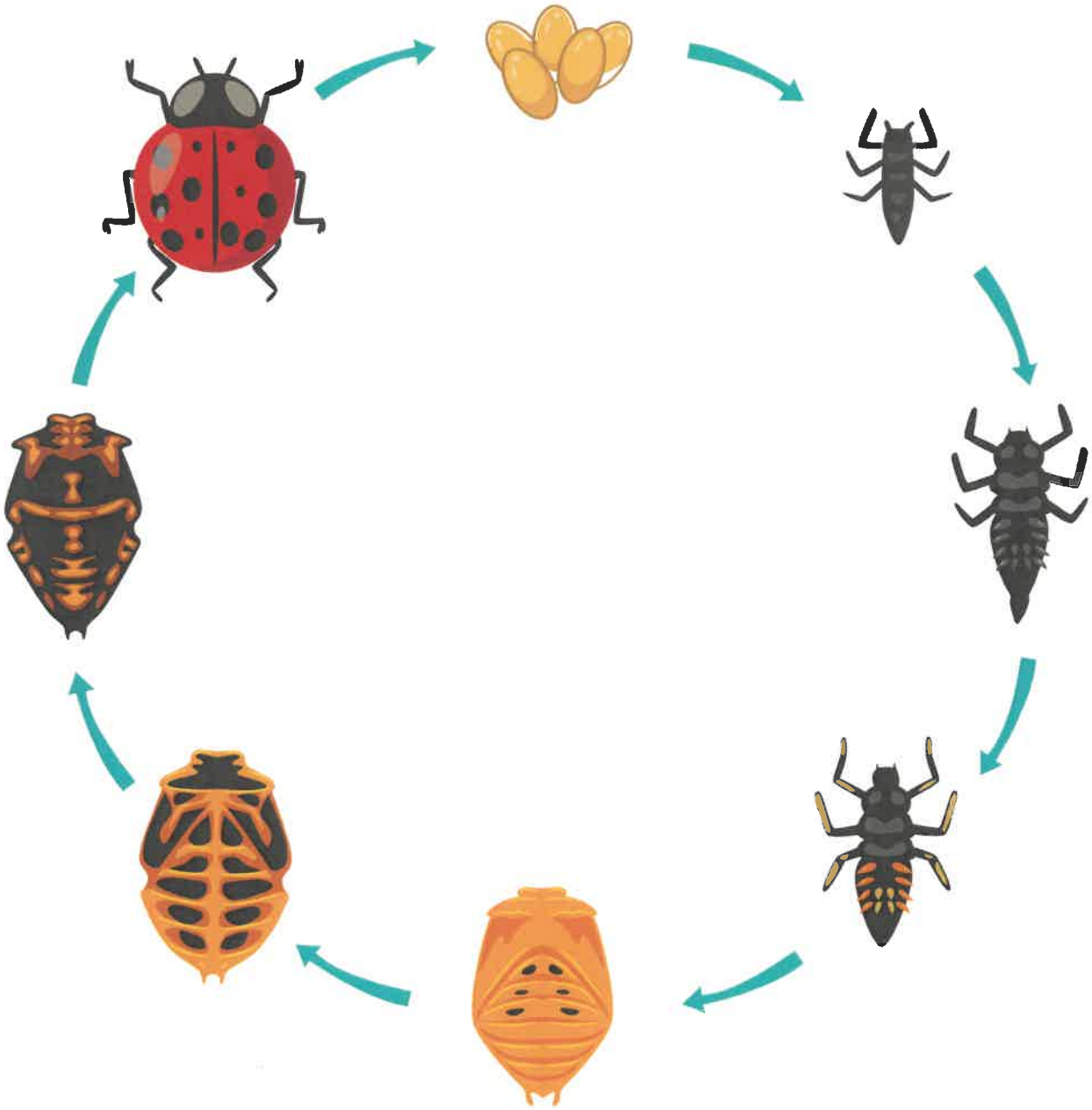
🔁 Closure

Review the stages and emphasize that ladybugs change a lot as they grow. Reinforce the concept of metamorphosis.

🌟 Extensions & Supports

- Compare ladybug and butterfly life cycles
- Use visuals and labels to support learning
- Have advanced students write sentences about each stage





🐔 Life Cycle of a Chicken – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a chicken's life cycle
- Describe changes at each stage
- Sequence the stages in order
- Learn vocabulary for male and female chickens

🧠 Key Vocabulary

Life cycle, egg, chick, adult
Hen (female chicken), Rooster (male chicken)

🐔 Chicken Life Cycle Stages

1. **Egg** – The life cycle begins inside an egg laid by a hen. The chick develops inside the egg.
2. **Chick** – A baby chicken hatches from the egg. Chicks are small, soft, and covered with down feathers.
3. **Growing Chicken (Juvenile)** – The chick grows larger, develops feathers, and becomes stronger.
4. **Adult Chicken** – A fully grown chicken.
    - A **female** is called a **hen**
    - A **male** is called a **rooster**
      Adult chickens can reproduce, and hens lay eggs to begin the cycle again.

🚀 Lesson Activities

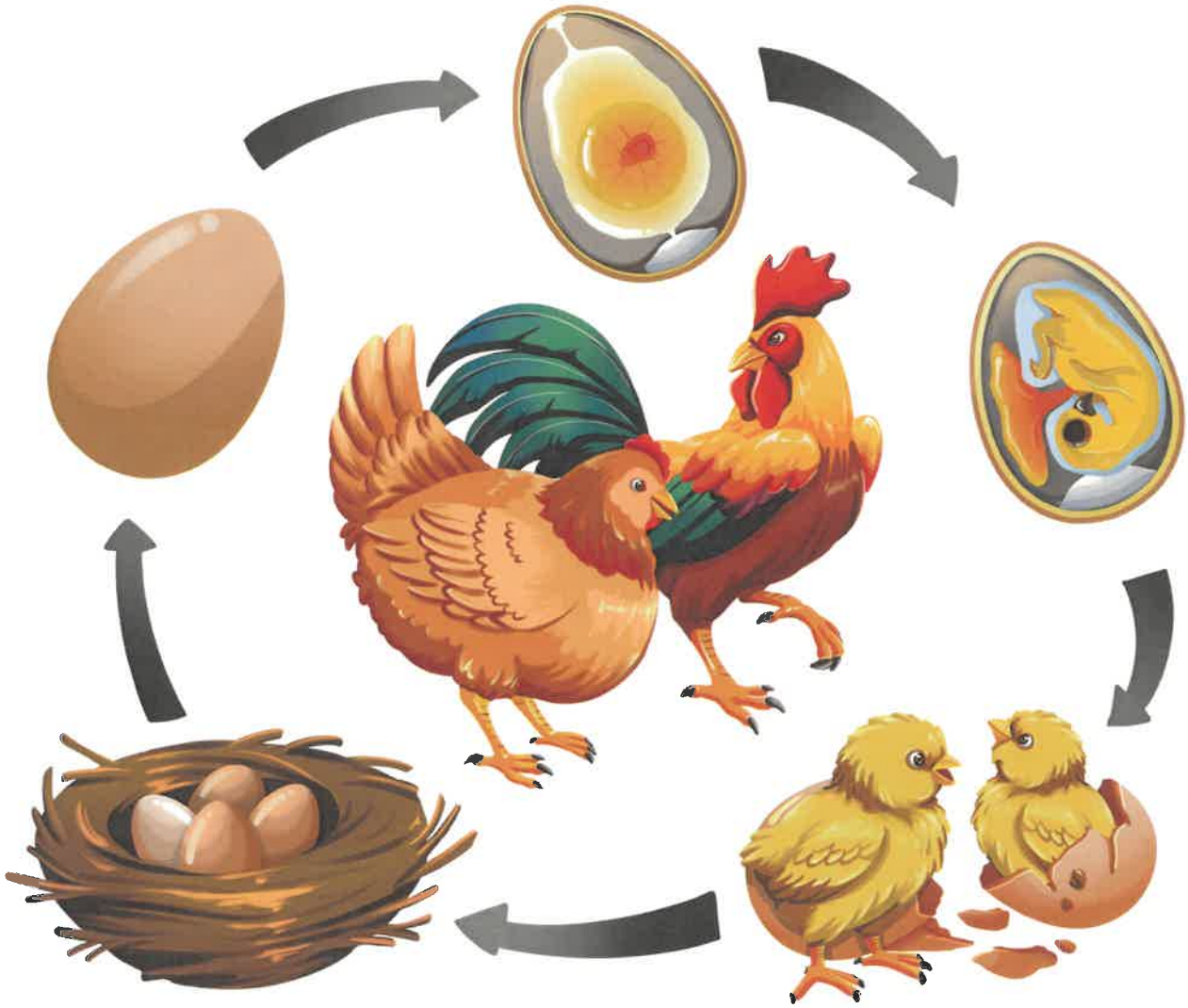
- **Introduction:** Ask students if they have seen chickens or eggs; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange life cycle pictures in the correct order.

🔄 Closure

Review the stages and reinforce that chickens grow and change over time.

🌟 Extensions & Supports

- Compare chicken life cycle with frogs or butterflies
- Use real or toy models for hands-on learning
- Have advanced students write sentences about each stage



🐝 Life Cycle of a Bee – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the four stages of a bee's life cycle
- Describe how bees change at each stage
- Sequence the stages correctly
- Understand basic roles of bees in a colony

🧠 Key Vocabulary

Life cycle, egg, larva, pupa, adult bee
Queen bee, worker bee, drone

🐝 Bee Life Cycle Stages

1. **Egg** – The queen bee lays tiny eggs inside honeycomb cells.
2. **Larva** – The egg hatches into a worm-like larva that is fed by worker bees and grows quickly.
3. **Pupa** – The larva forms a pupa inside the cell, where it changes into an adult bee.
4. **Adult Bee** – A fully grown bee emerges. There are different types of adult bees:
    - **Queen bee** – lays eggs
    - **Worker bees** (female) – gather food and care for the hive
    - **Drones** (male) – help with reproduction

🚀 Lesson Activities

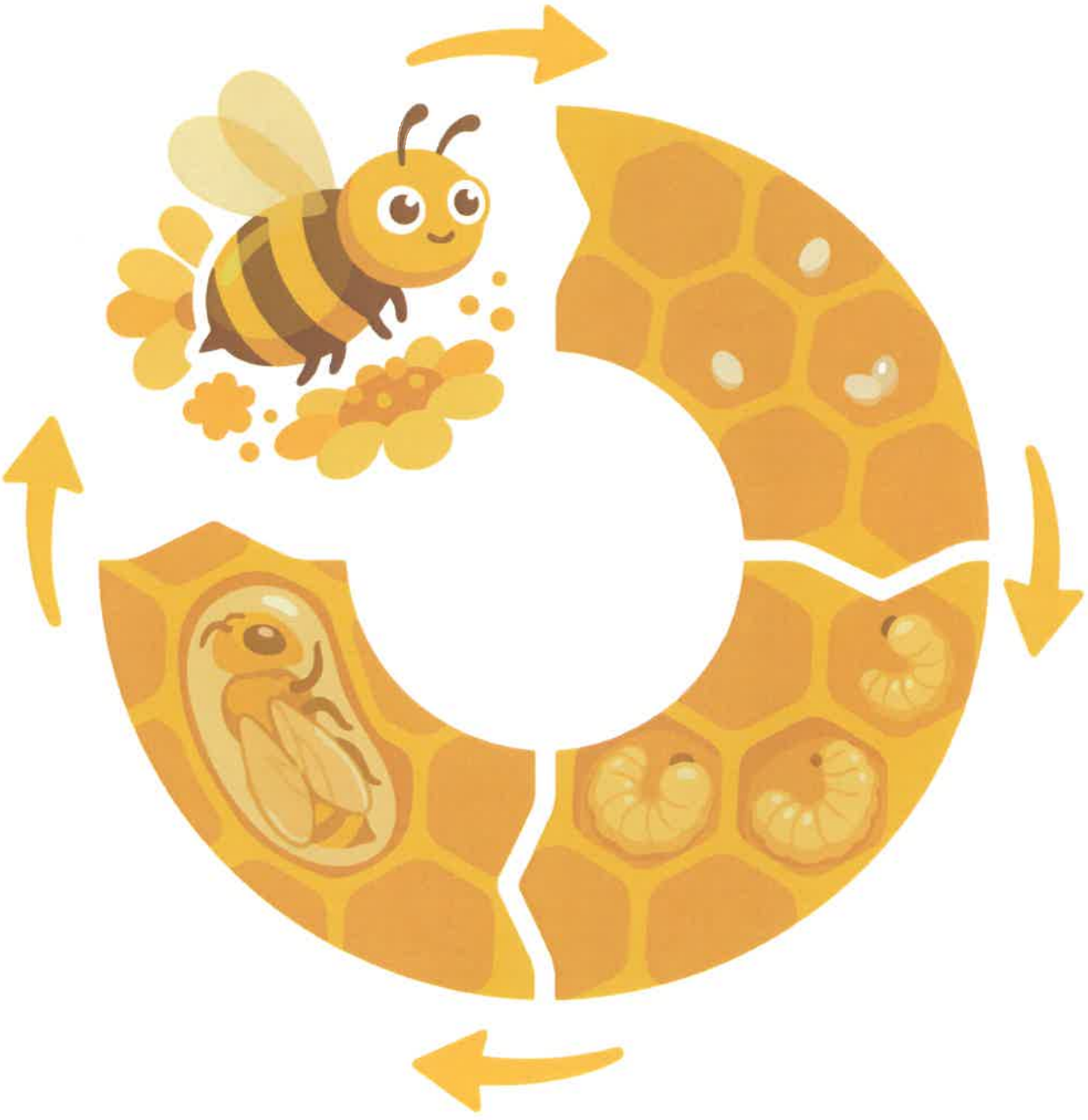
- **Introduction:** Ask students what they know about bees; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange the life cycle stages in order.
- **Independent Work:** Students complete a worksheet, draw the stages, or create a bee life cycle craft.

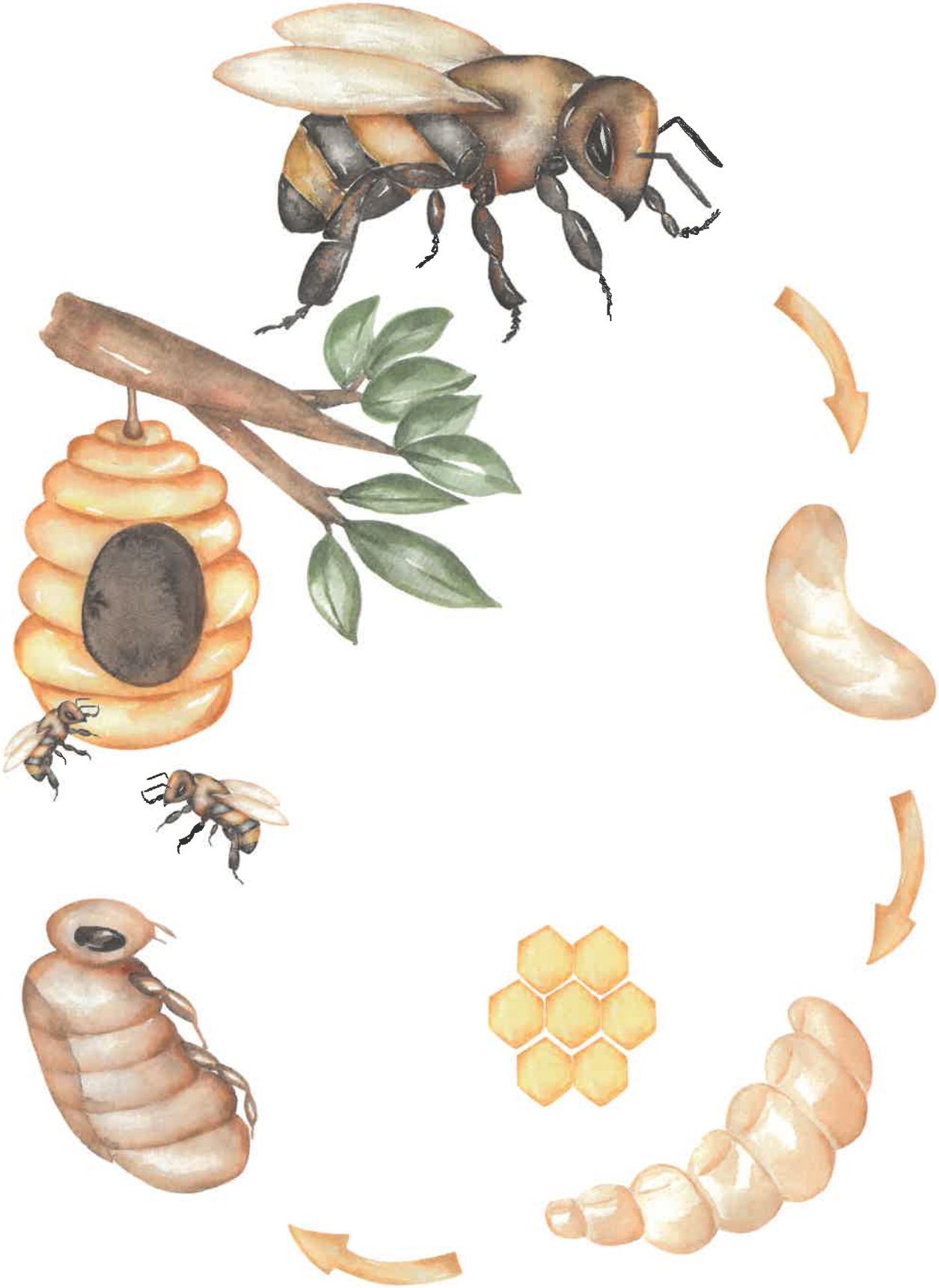
🔁 Closure

Review the stages and explain how bees grow and work together in a hive.

🌟 Extensions & Supports

- Compare bee life cycle with butterfly or ladybug
- Discuss why bees are important (pollination)





🐙 Life Cycle of an Octopus – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of an octopus's life cycle
- Describe how octopuses change as they grow
- Sequence the stages correctly

🧠 **Key Vocabulary:** Life cycle, egg, larva, juvenile, adult octopus, hatchling

🐙 Octopus Life Cycle Stages

1. **Egg** – Eggs are laid by the female octopus and attached in clusters to rocks or surfaces. The mother protects and cares for them until they hatch.
2. **Larva (Hatchling)** – Tiny octopuses hatch from the eggs and float in the water. They are very small and drift in the ocean currents.
3. **Juvenile Octopus** – As they grow, they begin to settle near the ocean floor, hunt food, and develop stronger bodies.
4. **Adult Octopus** – A fully grown octopus lives on the ocean floor, hunts for food, and can reproduce to start the life cycle again.

🚀 Lesson Activities

- **Introduction:** Ask students what they know about octopuses; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange the life cycle stages in order.
- **Independent Work:** Students draw the stages, label them, or complete a worksheet.

✅ Assessment

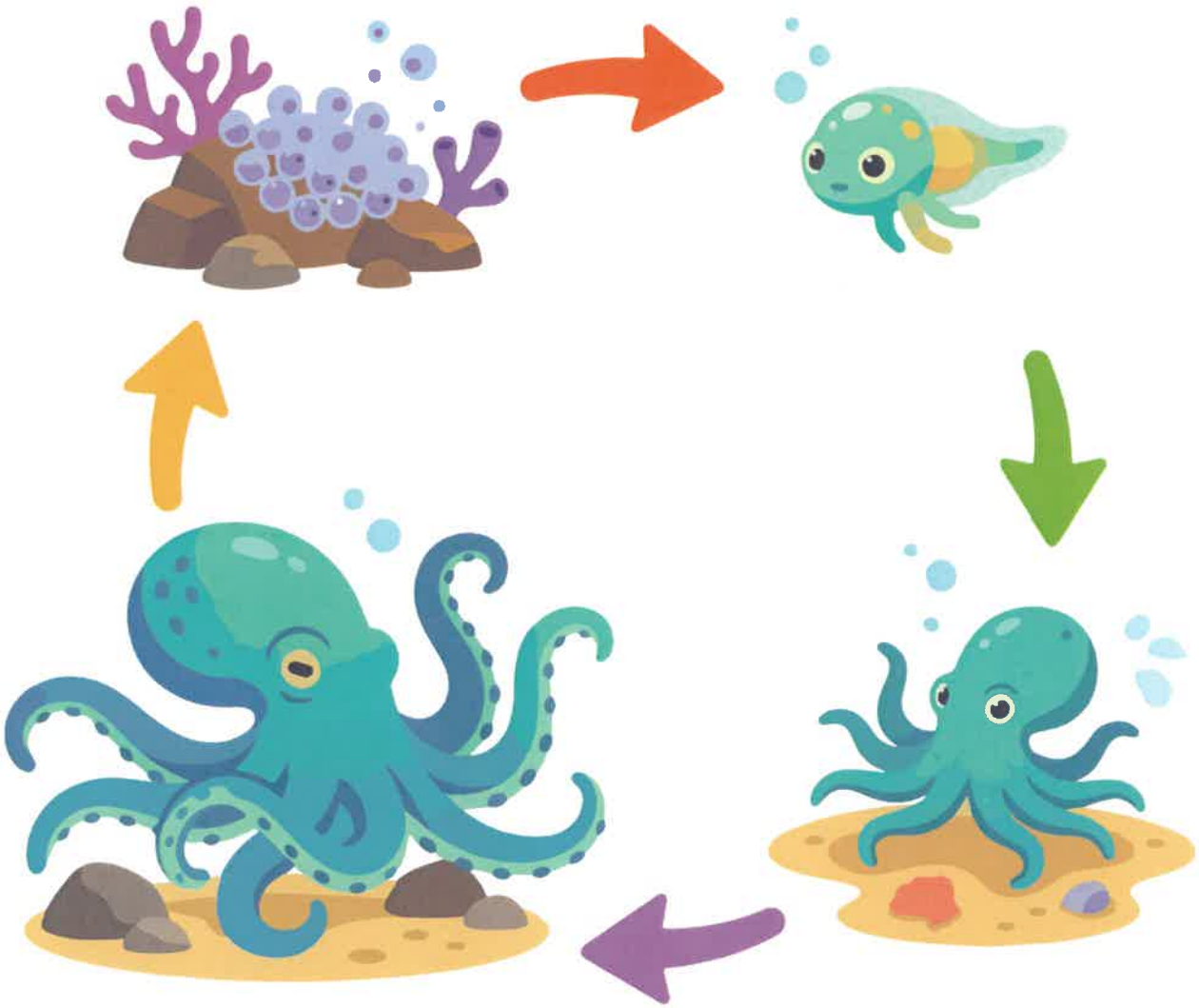
- Students name or describe one stage of the life cycle
- Drawing or labeling activity to show understanding

🔄 Closure

Review the stages and discuss how octopuses grow in the ocean. Reinforce that all animals have life cycles.

🌟 Extensions & Supports

- Compare octopus life cycle with land animals or insects
- Discuss ocean habitats and animal survival



🌿 Life Cycle of a Fern – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a fern's life cycle
- Describe how ferns grow and change
- Sequence the stages in order
- Understand that some plants reproduce using **spores** instead of seeds

🧠 Key Vocabulary

Life cycle, spores, germination, gametophyte, fern plant, frond

🌿 Fern Life Cycle Stages

1. **Spores** – Ferns release tiny spores (like dust) from the underside of their leaves (called fronds).
2. **Germination** – When spores land in a moist place, they begin to grow into a tiny, flat plant.
3. **Gametophyte (Young Plant Stage)** – This small plant produces the cells needed to grow a new fern.
4. **Adult Fern** – A full-grown fern develops with roots and fronds and produces spores, starting the cycle again.

🚀 Lesson Activities

- **Introduction:** Ask students if they have seen ferns; show real plants or pictures.
- **Teaching:** Explain each stage with diagrams or visuals.
- **Guided Practice:** Students sequence the life cycle stages in order.
- **Independent Work:** Students draw and label the stages or complete a worksheet.

✅ Assessment

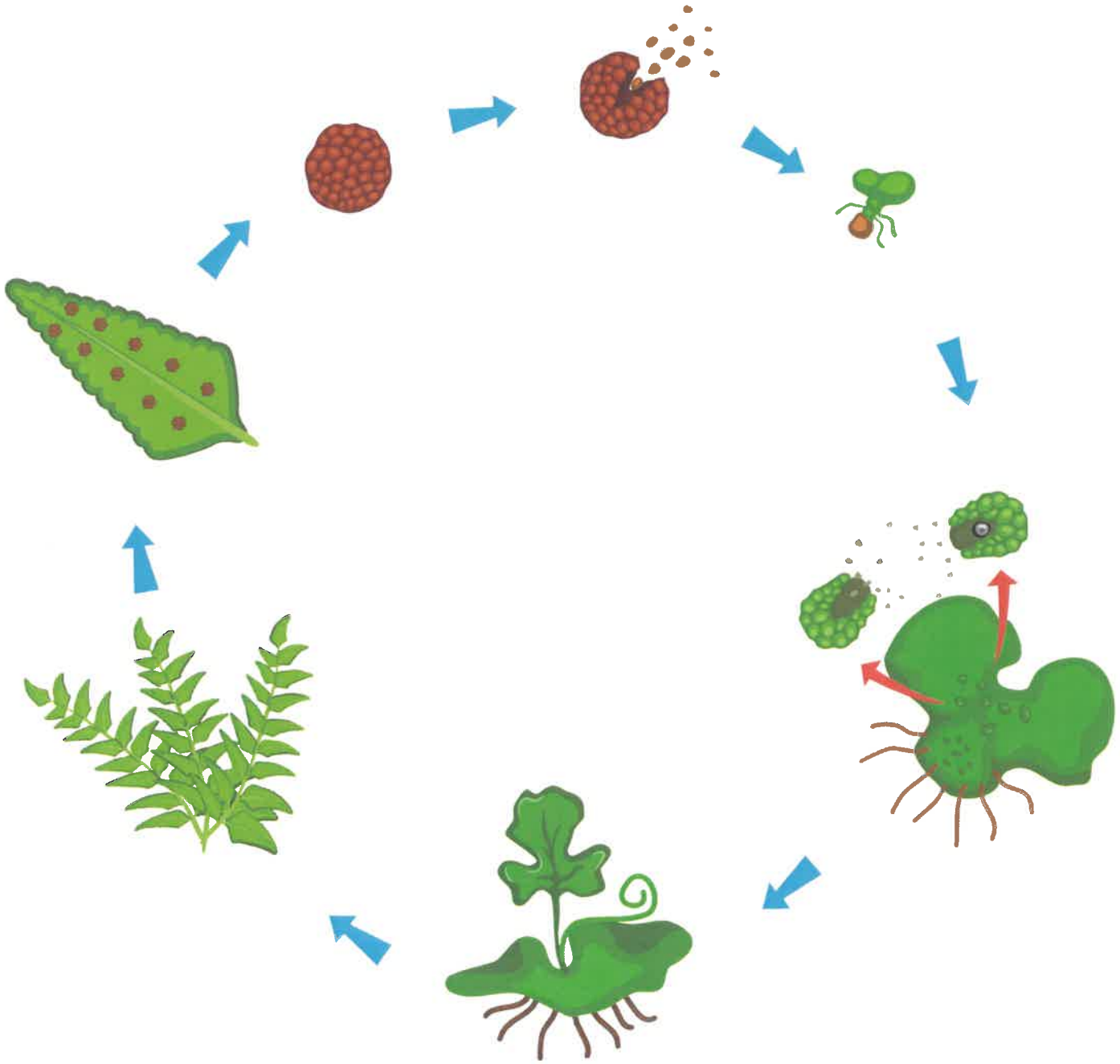
- Students name or describe one stage
- Drawing or labeling activity to demonstrate understanding

🔁 Closure

Review how ferns grow and emphasize that, unlike many plants, ferns do not use seeds but reproduce with spores.

🌟 Extensions & Supports

- Compare fern life cycle with flowering plants (seed vs. spore)
- Go on a nature walk to find ferns



🦀 Life Cycle of a Crab – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a crab's life cycle
- Describe how crabs change as they grow
- Sequence the stages correctly
- Understand that crabs grow by **molting** (shedding their shell)

🧠 **Key Vocabulary:** Life cycle, egg, larva, juvenile, adult crab, molt, shell

🦀 Crab Life Cycle Stages

1. **Egg** – Female crabs carry eggs under their bodies until they hatch.
2. **Larva** – Tiny larvae hatch and float in the water. They look very different from adult crabs.
3. **Juvenile Crab** – As they grow, they begin to look more like crabs and move to the ocean floor. They shed their shells (molt) as they grow bigger.
4. **Adult Crab** – A fully grown crab lives on the ocean floor, has a hard shell, and can reproduce to start the life cycle again.

🚀 Lesson Activities

- **Introduction:** Ask students what they know about crabs; show pictures or a short video.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange the life cycle stages in order.
- **Independent Work:** Students draw, label, or complete a worksheet about the stages.

✅ Assessment

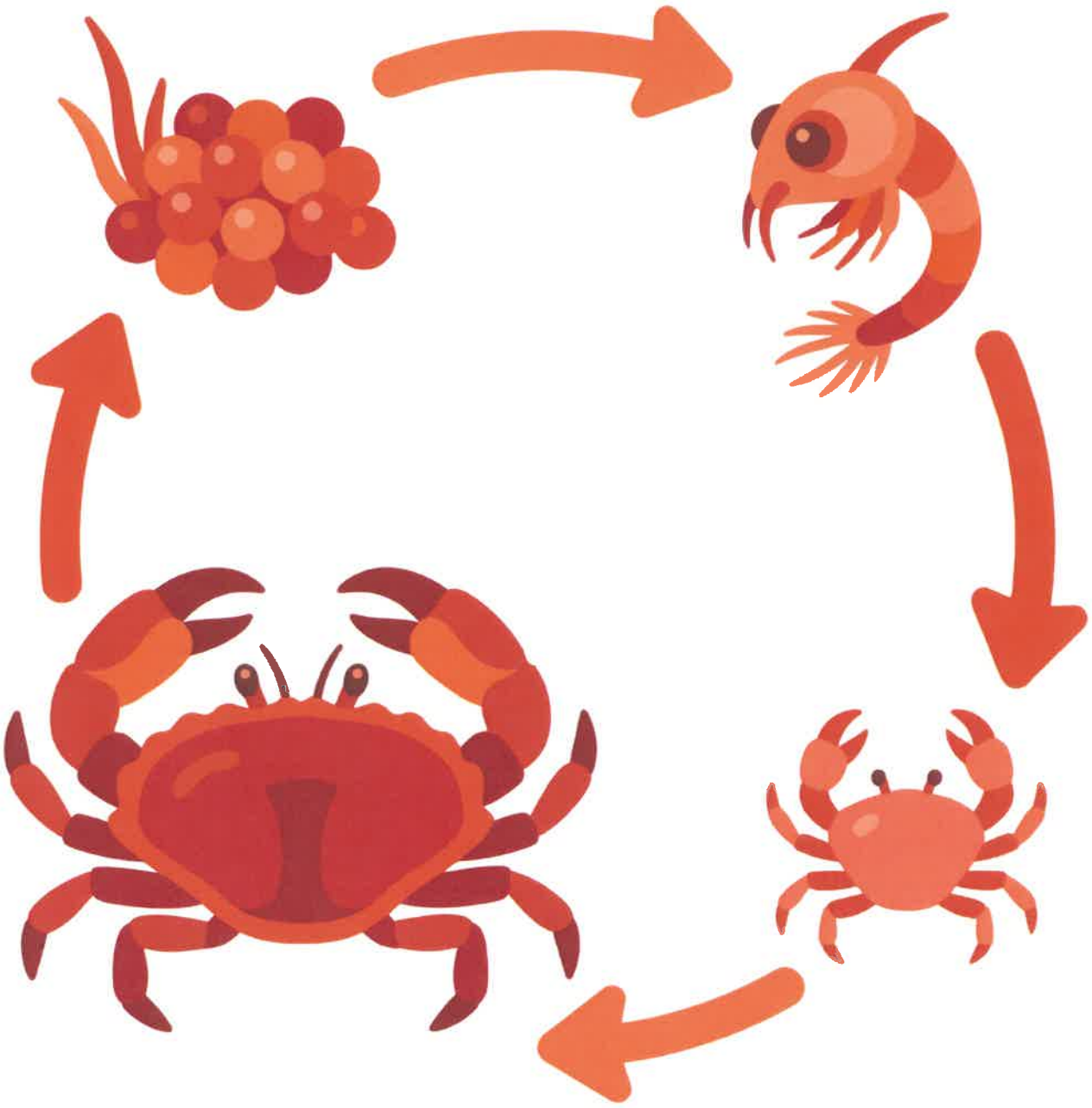
- Students name or describe one stage of the life cycle
- Drawing or labeling activity to show understanding

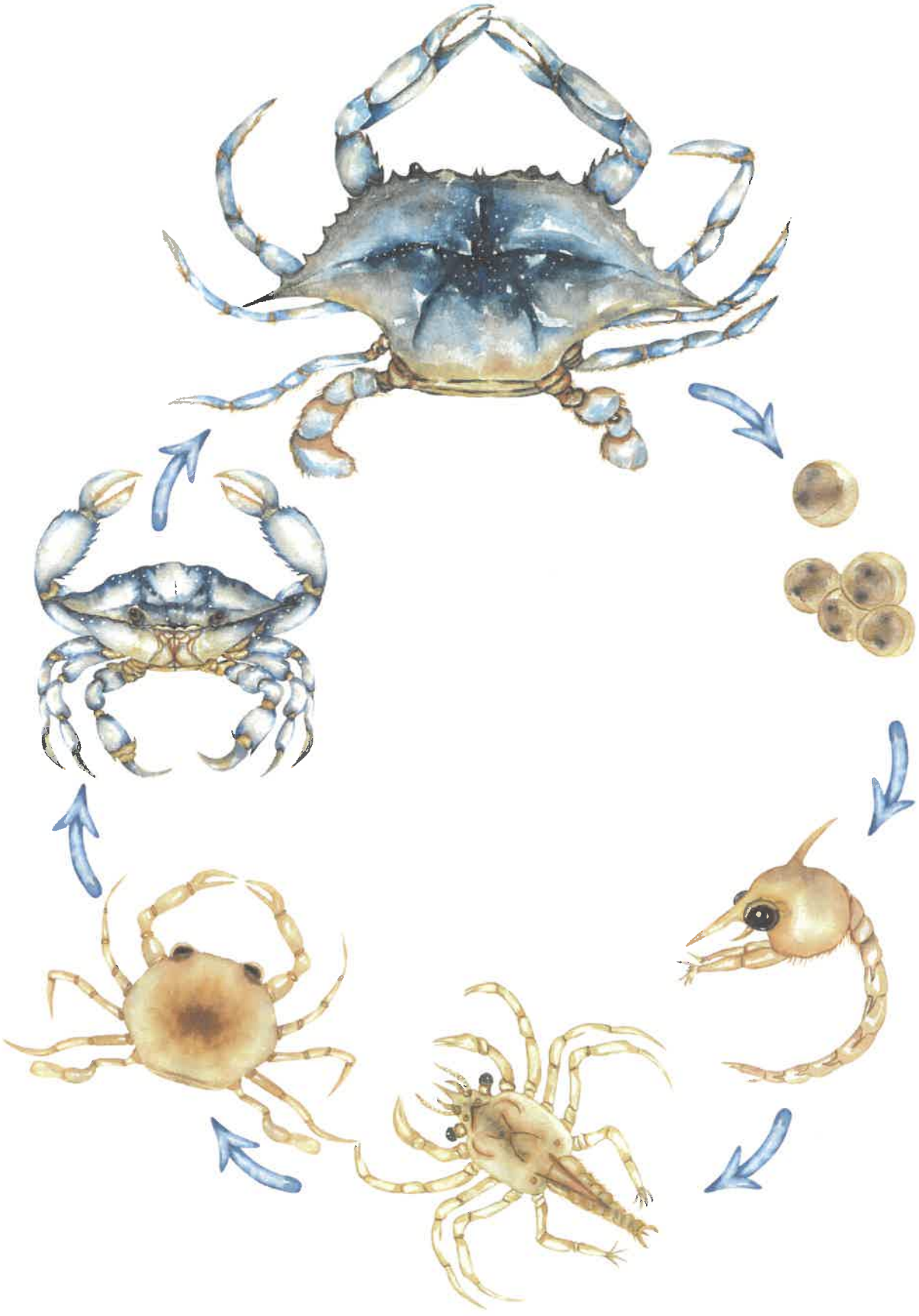
🔁 Closure

Review the stages and explain how crabs grow by shedding their shells. Reinforce that all animals have life cycles.

🌟 Extensions & Supports

- Compare crab life cycle with other ocean animals
- Discuss ocean habitats and how crabs survive





🍓 Life Cycle of a Strawberry Plant – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a strawberry plant's life cycle
- Describe how the plant grows and changes
- Sequence the stages in order
- Understand that strawberry plants can grow from seeds and runners

🧠 Key Vocabulary

Life cycle, seed, germination, seedling, flower, fruit, runner

🍓 Strawberry Plant Life Cycle Stages

1. **Seed** – The life cycle begins with a tiny seed (often found on the outside of the strawberry fruit).
2. **Germination** – The seed begins to grow when it has water, sunlight, and soil, forming roots and a small shoot.
3. **Seedling/Young Plant** – A small plant grows with leaves, roots, and stems.
4. **Flowering Plant** – The plant produces white flowers, which are necessary for fruit to grow.
5. **Fruit (Strawberry)** – The flowers develop into strawberries, which contain seeds and can be eaten.
6. **Runner (New Plants)** – Strawberry plants grow long stems called runners that spread along the ground and grow into new plants.

🚀 Lesson Activities

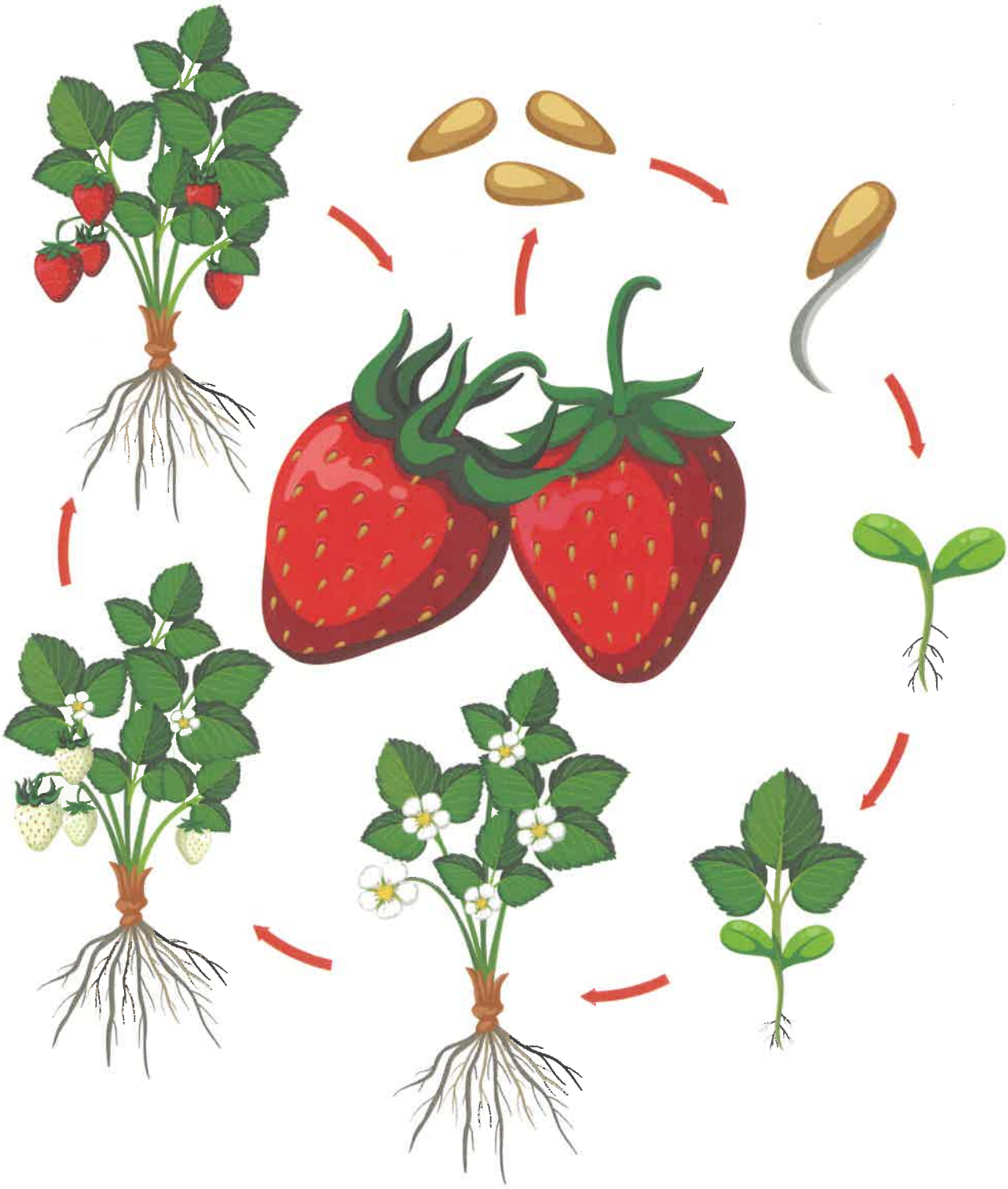
- **Introduction:** Ask students if they have eaten strawberries; show real strawberries or pictures.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students sequence the life cycle stages in order.
- **Independent Work:** Students draw, label, or complete a worksheet about the stages.

🔄 Closure

Review the stages and highlight that strawberries can grow new plants in more than one way (seeds and runners).

🌟 Extensions & Supports

- Grow strawberry plants in class or observe a garden
- Compare strawberry plants to other fruit plants



🍅 Life Cycle of a Tomato Plant – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a tomato plant's life cycle
- Describe how the plant grows and changes
- Sequence the stages in order
- Understand what plants need to grow (sunlight, water, soil)

🧠 Key Vocabulary

Life cycle, seed, germination, seedling, flower, fruit, roots, stem, leaves

🍅 Tomato Plant Life Cycle Stages

1. **Seed** – The life cycle begins with a small tomato seed planted in soil.
2. **Germination** – The seed absorbs water and begins to sprout, growing roots downward and a shoot upward.
3. **Seedling** – A young plant appears above the soil with small leaves and a growing stem.
4. **Mature Plant** – The plant grows taller and develops more leaves and strong roots.
5. **Flowering Stage** – Yellow flowers grow on the plant.
6. **Fruit (Tomato)** – The flowers turn into tomatoes, which contain seeds and can be eaten. The seeds can grow into new plants.

🚀 Lesson Activities

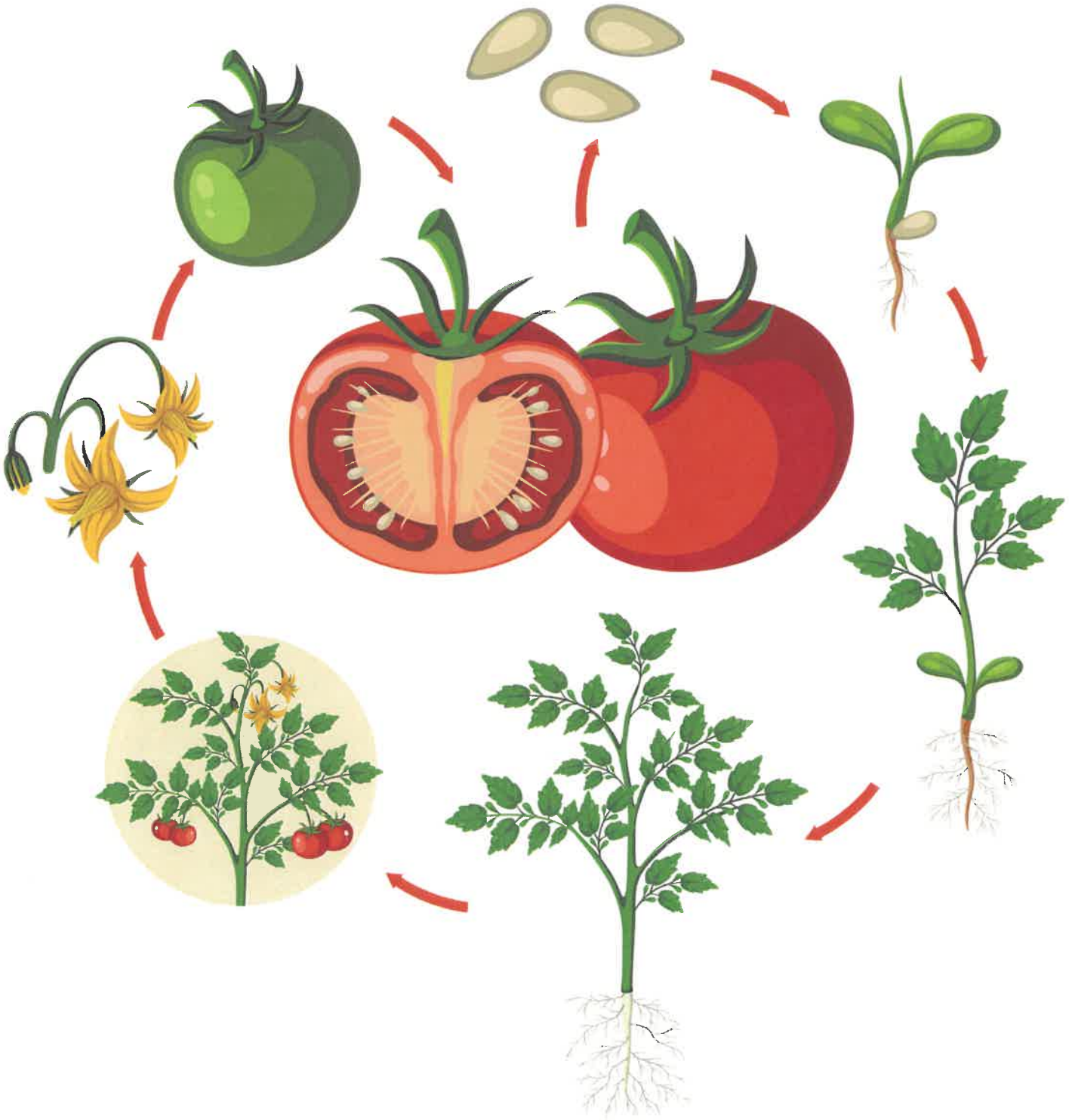
- **Introduction:** Ask students if they have eaten tomatoes; show a real tomato or pictures.
- **Teaching:** Explain each stage using visuals or diagrams.
- **Guided Practice:** Students arrange the life cycle stages in order.
- **Independent Work:** Students draw, label, or complete a worksheet about the stages.

🔄 Closure

Review the stages and highlight that tomatoes grow from seeds and produce fruit with seeds inside.

🌟 Extensions & Supports

- Grow tomato plants in class or observe a garden
- Compare tomato plants to other fruit plants (like strawberries)
- Provide visuals and sentence starters for support



🌸 Life Cycle of a Cherry Tree (One Year) – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the seasonal stages of a cherry tree
- Describe how the tree changes throughout the year
- Understand how seasons affect plant growth
- Sequence the stages in order

🧠 **Key Vocabulary:** Seasons, spring, summer, fall (autumn), winter
buds, blossoms, fruit, leaves

🌸 Cherry Tree Yearly Cycle Stages

1. **Winter (Dormant Stage)** – The tree rests with no leaves. It looks bare but is still alive and conserving energy.
2. **Spring (Blossoming Stage)** – Buds form and open into beautiful pink or white blossoms (flowers).
3. **Early Summer (Fruit Growing Stage)** – The blossoms turn into small cherries as the fruit begins to grow. Leaves are fully developed.
4. **Late Summer (Ripe Fruit Stage)** – Cherries ripen and are ready to be picked. The tree is full and green.
5. **Fall (Leaf Change Stage)** – Leaves change color (yellow, orange, or red) and fall off the tree as it prepares for winter.

🚀 Lesson Activities

- **Introduction:** Ask students what happens to trees in different seasons; show pictures of cherry trees year-round.
- **Teaching:** Explain each seasonal stage using visuals or diagrams.
- **Guided Practice:** Students arrange pictures of the yearly cycle in order.
- **Independent Work:** Students draw the tree in each season or complete a labeling worksheet.

🔄 Closure

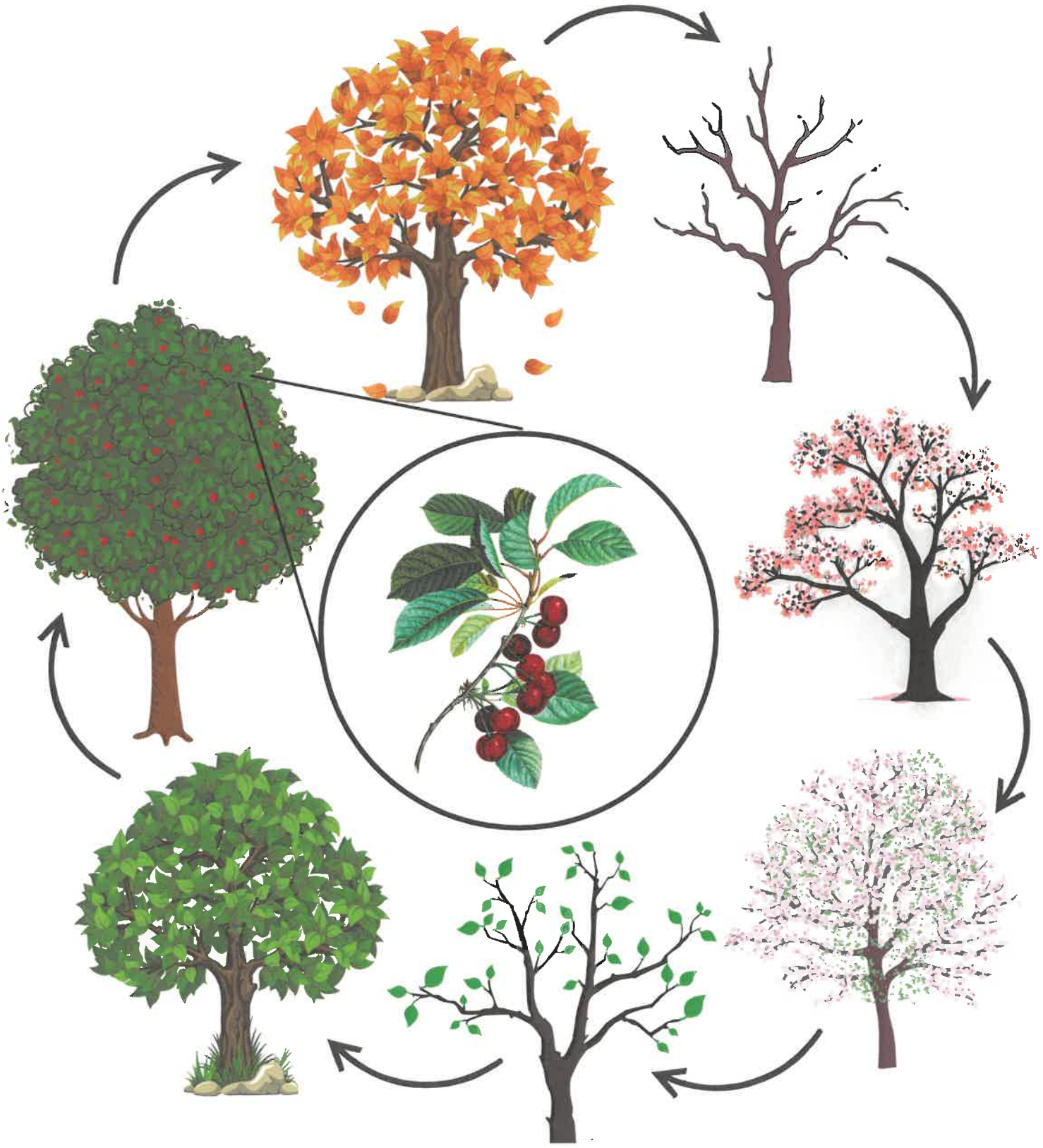
Review how the cherry tree changes throughout the year. Reinforce that plants follow seasonal cycles.

🌟 Extensions & Supports

- Compare cherry trees to other trees or plants
- Observe seasonal changes outdoors

One Year

FOR A CHERRY TREE



🌱 Life Cycle of a Bean Plant – Lesson Summary

🎯 Learning Goals

Students will:

- Identify the stages of a bean plant's life cycle
- Describe how the plant changes at each stage
- Sequence the stages correctly
- Understand what plants need to grow (water, sunlight, soil)

🧠 Key Vocabulary

Life cycle, seed, germination, seedling, plant, roots, stem, leaves

🌱 Bean Plant Life Cycle Stages

1. **Seed** – The life cycle begins with a bean seed planted in soil.
2. **Germination** – The seed absorbs water, swells, and begins to sprout roots and a small shoot.
3. **Seedling** – A young plant emerges above the soil with small leaves and a growing stem.
4. **Developing Plant** – The plant grows larger, develops more leaves
5. **Mature Bean Plant** - The plant produces flowers and beans (seeds).

🚀 Lesson Activities

- **Introduction:** Ask students what plants need to grow; show a real seed or picture.
- **Teaching:** Explain each stage with visuals or a diagram.
- **Guided Practice:** Students sequence pictures of the plant life cycle.
- **Independent Work:** Students complete a worksheet, draw the stages, or plant a bean seed.

✅ Assessment

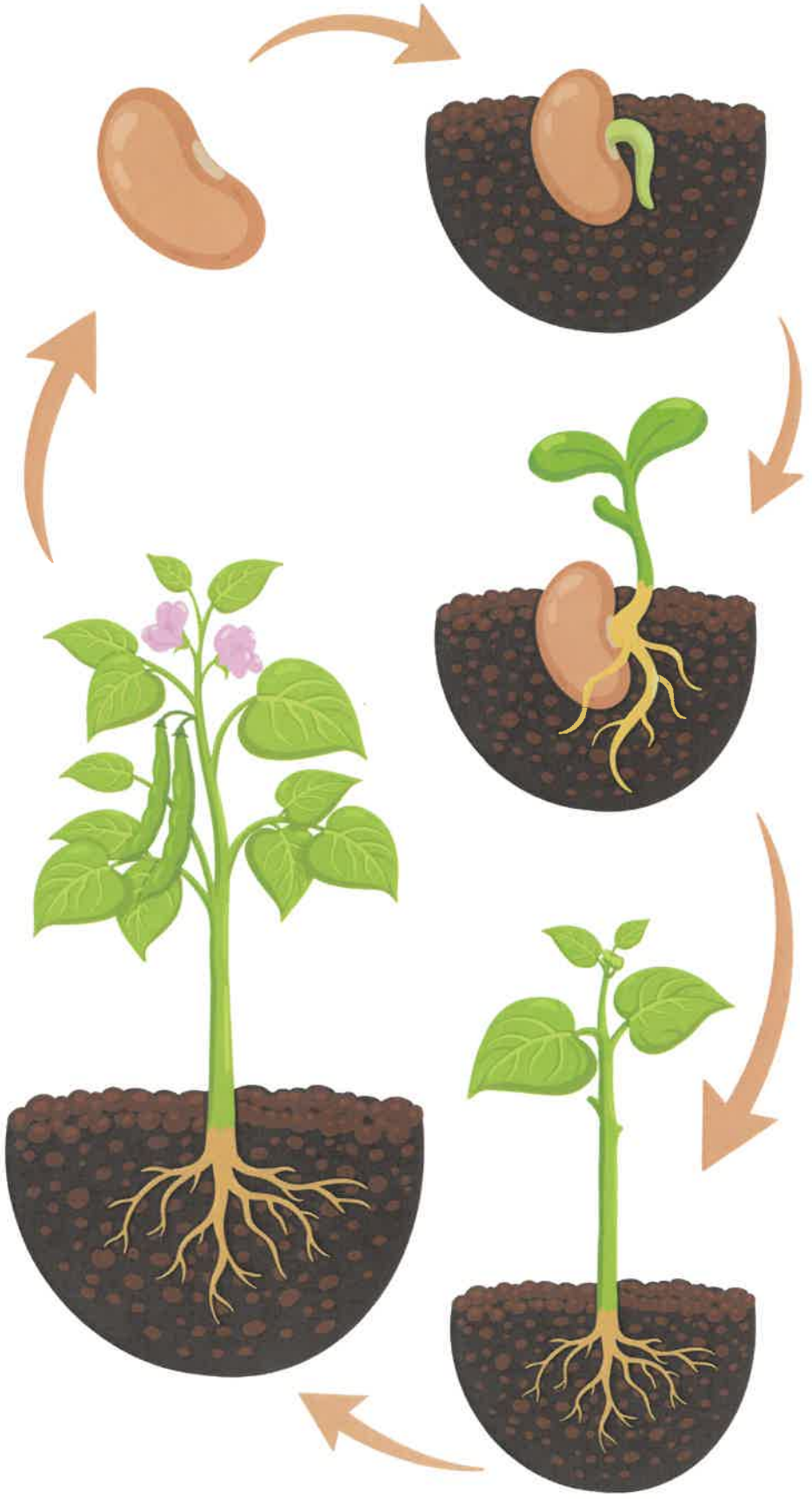
- Students describe one stage of the plant's growth
- Drawing or labeling activity to check understanding

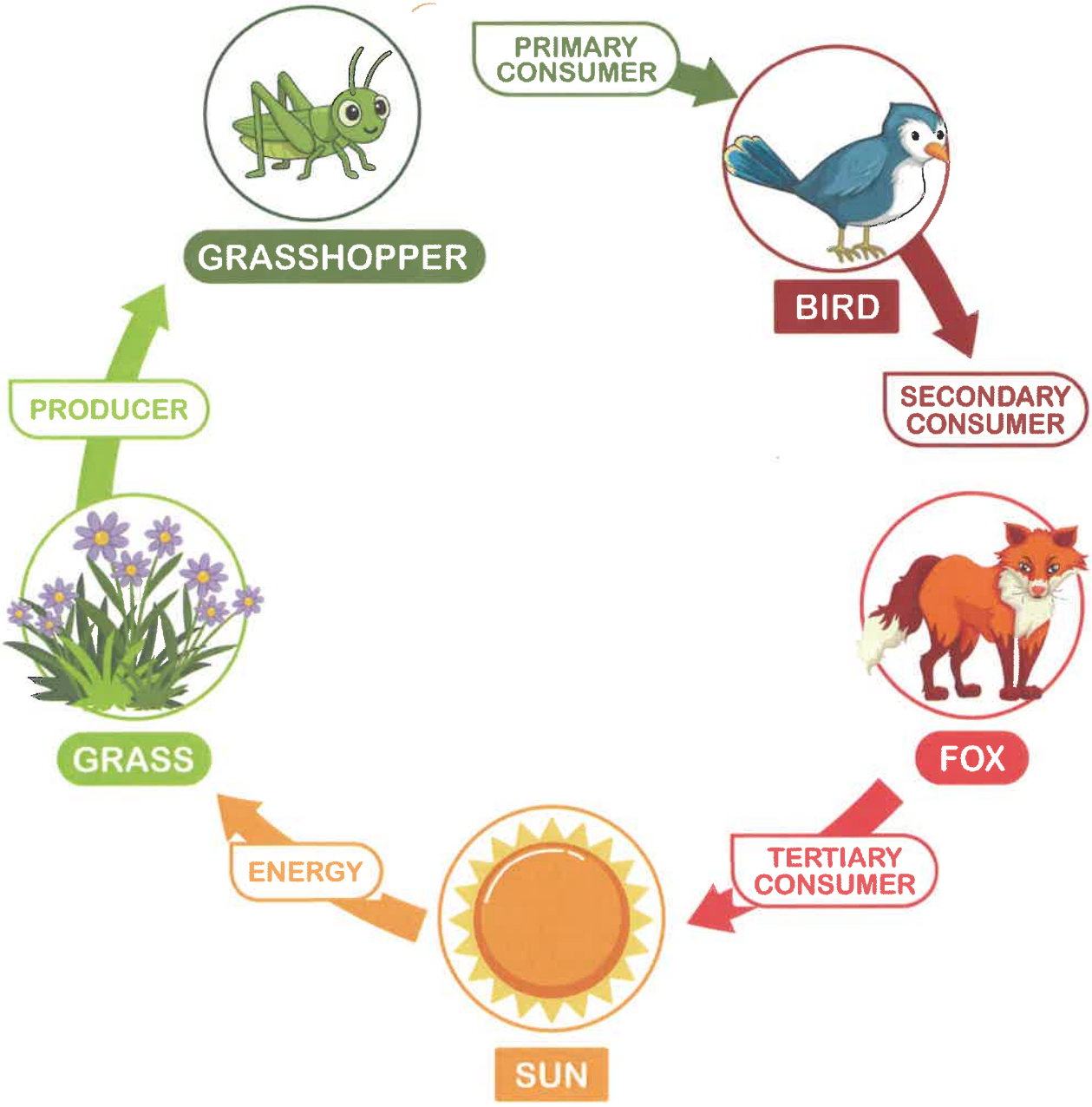
🔄 Closure

Review the stages and discuss how plants grow over time. Reinforce that all living things have life cycles.

🌟 Extensions & Supports

- Grow beans in the classroom and observe changes daily
- Compare plant life cycles with animals



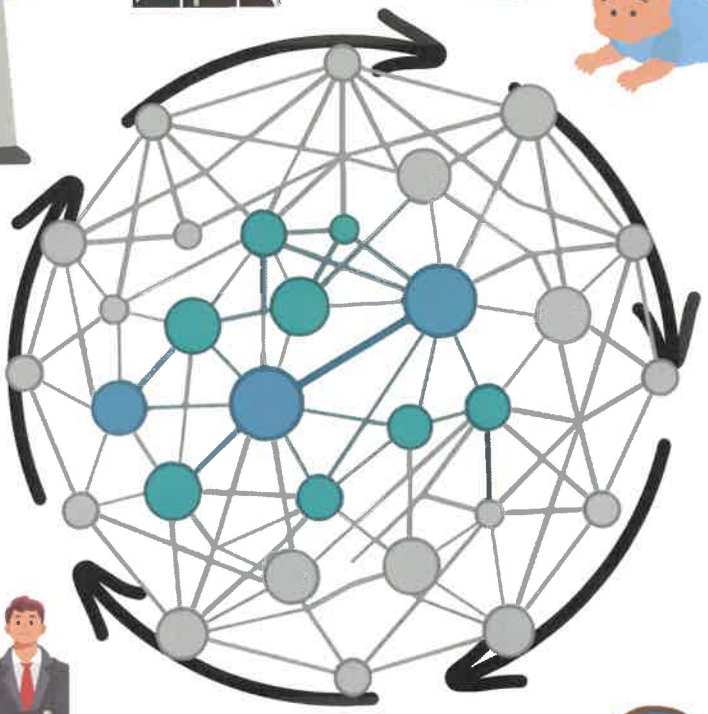

GRASSHOPPER
PRIMARY CONSUMER
BIRD
SECONDARY CONSUMER
FOX
TERTIARY CONSUMER
SUN
ENERGY
GRASS
PRODUCER


















One human lifetime can connect up to seven generations