# EXPLAIN HOW LIVING THINGS ARE SUITED TO THEIR PARTICULAR HABITAT.
## UNDERSTANDING THE PROCESS OF AND THE FACTORS THAT INFLUENCE GERMINATION.

### ESSENTIAL QUESTION:
### IF MY MIND IS A GARDEN ARE MY THOUGHTS THE SEEDS?

## WHAT ARE WE LEARNING?
- Carrying out appropriate investigations to develop simple explanations.
- Describing the key attributes that enable development and evaluation of an outcome.
- Using knowledge of the germination process to accelerate a seeds growth.

## TRY THIS WITH
- Year 3-8
- Students who enjoy problem solving.
- Students who love inventing things.

## FIND

| | |
|---|---|
| Observe | Explain |
| Recall | Outline |
| Compare | Define |

Watch - There's no such thing as a vegetable.

Locate seeds in fruits or vegetables that the students have brought in their lunch.

Watch timelapses of seeds germinating and growing.

Predict what seeds require to grow.

Watch 'Who needs dirt?' and re-visit class answers.

Watch 'Got seeds?' And use beans to introduce the concept of germination.

Identify the seed coat and the plant embryo.

Record the scientific jargon in the process.

Use Randall Munroe's Thing Explainer as inspiration to better explain the jargon.

Understand the process of scarification by watching the full 'Got Seeds?' video.

Research and collate sprouting tips and ideas to make the seeds germinate faster.

## APPLY

| | |
|---|---|
| Teach | Establish |
| Simulate | Function |
| Plan | Research |

Visit a greenhouse at a local community garden or botanic garden.

Ask: How does a greenhouse work?

Use the Biodiversity Fact Sheet to understand thermal energy and energy transfer.

Understand the role that thermal mass, heat energy and transparent material play.

Experiment with materials that serve as a thermal mass around the school.

Connect these elements to the factors identified as being essential for germination.

Explain that students will design miniature greenhouses to help our seeds sprout faster.

Collate mini greenhouse ideas on a Pinterest board.

Select a miniature greenhouse that utilises the 3 important factors.

Use Google Sketch-Up to design and plan the miniature greenhouse.

Construct your greenhouse and place your planted seeds inside.

## PRODUCE

| | |
|---|---|
| Build | Measure |
| Design | Validate |
| Solve | Theorise |

Plant your seeds in your miniature greenhouse environment.

Use Life Garden Tracker to predict growth milestones of your seeds.

Focus students on maintaining the necessary environment for the seedlings to grow.

Monitor and graph the temperature fluctuations of your greenhouse.

Create a twitter or instagram feed for your seeds (real or imagined).

Use the feed as a way of keeping track of your 'partner class' progress.

Watch the How to Grow a Giant Pumpkin timelapse video.

Ask: Why does the pumpkin vine want to grow out of the greenhouse?

Create a timelapse or stop start animation of your seedling as it grows.

Try and capture its phototropic movements on camera.

Challenge students to discover what is causing the movement.

Use Spotify to find a soundtrack that suits the progress of your seedling.

## SUCCESS CRITERIA

**Students can check they have successfully completed the task by:**

- Explaining the process of germination in plain English without scientific jargon.
- Constructing a miniature greenhouse that makes provision for seedling growth factors.
- Documenting the growth of a seedling in an attempt to capture phototropic behaviours.

| PRINCIPLES | VALUES | KEY COMPETENCIES | LEARNING AREAS | WORD BANK | KEY CONCEPTS |
|---|---|---|---|---|---|
| Learning to Learn Future Focus | Ecological Sustainability Innovation, Inquiry and Curiosity | Participating and contributing Thinking | Science Technology | Germinate Scarification Conductivity Phototropic | Energy Transfer Germination Product Design Life Processes |