

Physical World: Exploring patterns of everyday examples of physical phenomena such as heat.

USING PROTOTYPING SKILLS AND SCIENCE KNOWLEDGE TO TURN A BREAKFAST FOOD INTO ICE CREAM.

ESSENTIAL QUESTION

Can we start our day the ice cream way?

WHAT ARE WE LEARNING?

- Asking questions, finding evidence and exploring simple models to develop simple investigations.
- Undertaking planning to identify the key stages and planning required to develop an outcome.
- Trialling and evaluating a prototype against key attributes to select and develop an outcome.

TRY THIS WITH

- Years 1-6
- Students who enjoy looking at things sideways.
- Students who love inventing.

FIND

- Define
- Observe
- Predict
- Classify
- Recognise
- Name

Collaborate as a class to co-create a story about characters who have to move from one side to another side until everything is exactly even.

Students will need to decide why the characters need to move in the first place as well as explain why everything needs to be even at the end of the story.

Transform the story into a 'whole of class play' and act it out.

Explain that heat always wants to move from a hotter to a cooler object.

Connect the elements of the class story to this scientific principle - the 2nd Law of Thermodynamics.

Challenge students to find instructional videos on ways to cool warm liquids down quickly.

Assign each video to a test group and have them copy the instructions for a real life test.

Analyse which video gives the best cooling technique.

Listen to the brain freeze podcast.

Ask: Is heat transfer part of what gives you an ice cream headache?

APPLY

- Experiment
- Manipulate
- Distinguish
- Prioritise
- Infer
- Establish

Watch 10 Minute Ice Cream and connect the explanation of heat transfer.

Use the Ice Cream Recipe Card to model creating a plain ice cream mixture.

Use Taylor Swift's 'Shake it off' and a timer to track shake time.

Discuss what is happening using scientific vocabulary - heat energy, heat transfer and equilibrium.

Ask: Where is the heat energy moving from/to? Why isn't the ice solid anymore?

Identify the heat transfer from the cream to the ice mixture as the cream mixture solidifies.

What do the straight rows of molecules in the ice look like now?

Listen to an ice cream "scientician" talk about the science of manufacturing ice cream.

Watch 'Macaroni Salad' to reinforce the scientific definitions of suspensions, colloids and solutions for yourself as an educator.

Understand that the type of mixture depends on the size of the particle.

Add ingredients of uneven particle size to change your 'colloid' (cream) to a suspension.

PRODUCE

- Construct
- Substitute
- Invent
- Defend
- Deconstruct
- Appraise

Ask: Could Toast and Marmite or Bacon and Eggs be made into Ice Cream?

Explain that students will transform breakfast into an ice cream flavour.

Agree on how the ice creams will be judged e.g. flavour, texture, breakfast food taste.

Create flip-grids where students say why they think their breakfast can (or can't) be ice cream.

Use instagram to search #breakfast and identify possible breakfasts to be ice cream.

Watch Love Local. Identify local flavours, fruits, local foods you could include.

Set up a shared 'breakfast flavours, table.

Prototype and taste flavour combinations before adding them to the colloid cream mixtures.

Highlight that the colloid cream mixture is changing to a suspension.

Consider evenly blending the suspension particles to create a better texture (and perhaps a colloid).

Create, name and present the breakfast ice creams using the Fail Safe Recipe Cards.

Taste test each other's ice creams.

Use the Ice Cream Taste Test Cards to record feedback and judge against the class criteria.



SUCCESS CRITERIA

Students can check they have completed the task successfully by:

- Understanding the principles of heat transfer by investigating methods to cool liquids quickly.
- Responding thoughtfully to the question Can [my breakfast] Ice cream? by way of a flipgrid.
- Creating a breakfast food ice cream and participating in a class wide taste test.

PRINCIPLES	VALUES	KEY COMPETENCIES	LEARNING AREAS	WORD BANK	KEY CONCEPTS
Future focus Learning to Learn	Innovation Inquiry and curiosity Excellence	Participating and contributing Thinking Relating to others	Science Technology	Mixture Suspension Colloid Equilibrium	Prototype Development Energy Transfer Mixtures Tally Charts