

Changes in State

CREAM TO BUTTER

ESSENTIAL QUESTION

What happens when cream is made into butter?

WHAT ARE WE LEARNING?

- The changes of state that occur when cream is whipped to produce butter
- The definition of a dairy product
- Understanding the changes in state between a liquid and solid
- The concept of physical change through making butter

TRY THIS WITH

- Years 1-2 (with parent help);
Years 3-4 (in small groups)
- Students who have an interest in how things change
- Students who love following a process

FIND

- | | |
|----------|---------|
| Identify | Label |
| Name | Compare |
| Review | Outline |

Discuss solids and liquids and create a table of the things students can identify as either a solid or liquid from things around them every day.

Use a videoing tool such as Screenr to record the different responses for each section of this lesson.

Ask where do they think cream might come from? Is it a solid or a liquid?

Show the class the bottle of cream and beater.

Ask what do they think will happen to the cream? Record their answers.

Whip the cream and discuss at which point the class think a change of state might have taken place.

APPLY

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|------------|------------|
| Categorise | Illustrate |
| Construct | Manipulate |
| Research | Examine |

Watch the 'About Milk' video on TED-Ed.

Answer the 'think' series of questions.

Explain the process of making butter.

Record this series of responses on Screenr.

Revisit the TED-Ed video and talk through each step to ensure understanding.

Encourage the correct use of the scientific terms. To check for a deeper understanding, ask students to provide another example of something changing from a liquid to a solid.

PRODUCE

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|-----------|------------|
| Construct | Discuss |
| Elaborate | Experiment |
| Measure | Conclude |

Divide students into groups. Each group should have a measure of cream in a sealed jar or see-through container.

Encourage students to roll and shake the jar for about 30 minutes.

Ensure the students keep the cream constantly moving so the molecules will stick to one another and make butter.

While students are shaking the cream, revisit the scientific principles behind the change in state.

Compile the different Screenr shots into a class video that explains the process of changing cream to butter.

Extend students by melting one of the jars of butter to return it from a solid to a liquid.

What do you think will happen?

Predict - will it turn back into cream?

SUCCESS CRITERIA

Students can check they have completed the task successfully by:

- Drawing conclusions about the change from cream to whipped cream
- Drawing conclusions about the change from cream to butter
- Describing what happens when a liquid changes to a solid

PRINCIPLES	VALUES	KEY COMPETENCIES	LEARNING AREAS	WORD BANK	RESOURCES REQUIRED
Learning to learn Community engagement	Innovation, inquiry and curiosity Excellence Integrity	Thinking Using language, symbols and texts Participating and contributing	Science Technology CREST	Solid Liquid Change Process	About Milk TED-Ed Making cheese, butter and yoghurt Factsheet