



FOOD: EGGSCITING EGGSPERIMENTS

YEAR LEVELS

Year 3-4

THEME OF UNIT

These experiments are designed to help students understand that the same materials can have different properties, can undergo changes and can be used in a variety of ways.

Students have the opportunity to:

- A) Describe observable properties of eggs
- B) Describe observable changes that occur

ACTIVITY CURRICULUM LINKS

- English/Literacy
- Mathematics/Numeracy
- Study of Society and Environment or HSIE
- Health and Physical Education
- Vocational and Applied Learning
- Language other than English

ACTIVITY LINKS TO NATIONAL STATEMENTS OF LEARNING FOR SCIENCE

Science as a human endeavour

Broad learning objectives

- Students recognise scientific aspects of their everyday lives
- Students are able to recognise and apply the science in their own lives
- Students are able to identify scientific concepts in the workplaces of people in their community

Concepts developed

- Students can explore how they are engaging in science in their areas of interest and their activities both within school and beyond.
- Students are able to explore other regions of science that they encounter in their everyday lives.

Science as a way to know

Broad learning objectives

- Students learn to ask appropriate scientific questioning techniques
- Students are able to begin to make predictions about experiments, based on prior knowledge and expected outcomes.

Concepts developed

- Students learn appropriate questioning techniques, by asking questions about concepts that are familiar.
- Students are able to make predictions about experiments and were taught to plan experiments involving only a small number of steps, which related to their questions and predictions.
- Students were also taught to gather and collate data required for each experiment.
- Students were taught how to use the appropriate equipment and how to measure, record and present data.
- Students were also required to share and communicate their observations, results, ideas and understanding about each activity.

Science as a body of knowledge (Matter)

Broad learning objectives

- Students examine and compare the observable properties of common materials in a variety of everyday objects
- Students observe and describe how changing familiar materials changes their

Concepts developed

- Students were given the opportunity to examine and compare observable properties of the materials of which a variety of everyday products are made.
- Students were required to investigate how changing a material may change its observable properties.

PRIOR UNDERSTANDINGS RECOMMENDED FOR THE ACTIVITY

Lesson 1: How strong is an eggshell?

Students apply pressure to the top and bottom of the egg with their fingers and thumb to see if they can crack the egg.

Students hold the egg in their hands and squeeze as hard as they can.

Students place four eggs on their side in a rectangular shape on a plastic tray and place books on top of them to see how many books it takes to break an egg.

Repeat the same experiment using four eggs standing upright in an egg carton.

Compare the results.

Which way was stronger? Why?

Discuss the use of this oval shape in buildings from Roman times to today.

Lesson 2: What's inside the shell?

Solids and liquids- Observable properties of eggs

Students observe and identify the major features of an egg.

Students handle eggs and discuss tactile properties.

Students learn to separate the yolk and the white.

What does the shell feel, look, smell, taste like?

Why is it called "egg white" when it is clear?

Why is the yolk separate? What keeps it separate?

What does it feel, look, smell, taste like?

What happens when the yolk is pierced?

What happens when the egg and the yolk are mixed?

Introduce terms: translucent, opaque, solid, liquid

Equipment:

- 6 eggs - One for each group of 4 students
- Saucer
- Toothpicks
- Paper towel

Lesson 3: What happens when it is heated?

Observable Changes - Students describe observable changes as the teacher cracks an egg into a hot frypan and the eggs begin to cook.

Students describe what they see and why it is occurring.

What does it look like after it is cooked?

What changes have occurred?

What does it feel like after it is cooked?

Equipment:

- Electric frypan
- 1 egg
- Plate
- Paper towel

[Student worksheets A available as a separate download on the same webpage](#)

Lesson 4: How many different ways can eggs be cooked?

Students predict, observe, identify and compare the changes in properties, time taken, taste and smell as different ways of cooking occurs.

- Fried
- Soft boiled
- Hard boiled
- Poached
- Scrambled
- Beaten omelette

With teacher aide assistance, using stove and electric frypan, different methods of cooking are timed and observed by students. Different groups are allocated the task of preparing each type of cooking style and demonstrate to other groups with teacher and aide assistance with heating appliances.

Equipment:

- 12 eggs
- Stove
- 2 Frypan
- 2 Saucepans
- Omelette pan
- Electric frypan
- Whisk, Electric beater, manual egg beater, spoons, egg lifter, knife.

[Student worksheets B and C available as a separate download on the same webpage](#)

Lesson 5: Why does this egg bounce?

Students investigate the effect of vinegar on the shell of an egg overnight.

Students put an egg into a jar of vinegar and observe the reaction during the day.

Note the gas bubbles produced.

Repeat this with a seashell and note the reactions.

Introduce the term “acid” and “calcium carbonate”. Relate students knowledge of calcium in bones and teeth from “healthy food, healthy bodies” unit in HPE.

Lesson 6: Which one is the best “spinner”?

Students compare the spinning effects on a raw egg and a hard boiled egg.

Students discuss the possible reasons for the wobbling of the raw egg and the smooth spin of the hard boiled egg.

ASSESSMENT

- Lesson 1 was utilised as an introductory lesson. The type of assessment used for this particular lesson was diagnostic.
- Lesson 2 utilised the use of questioning as a form of assessment. This type of technique was used as a formative assessment.
- Lesson 3-4 were used as both a summative and formative style of assessment. Each worksheet was utilised by the teacher to ascertain the abilities of the students to compare information provided. These worksheets are attached to this file.
- Lessons 5-6 were utilised as those that might ascertain those of higher order thinking skills. These lessons were only formatively assessed.

TEACHER BACKGROUND INFORMATION

- Origins of the problem: As part of the “Healthy eating” Program promoted in the school, students are encouraged to try different options for quick, economical, healthy breakfasts. By presenting these activities, students are shown different ways to achieve this.
- Chemical Principles behind the activity: Cooking eggs causes a chemical change to occur. The substance breaks down and changes into something else. It is a permanent change and cannot be reversed. Heating eggs causes a chemical reaction to occur. The egg changes from one state to another. Properties – matter, Application of heat, Changing state.
- Experiment variations: Try other substances such as jelly, popcorn, creaming butter.

Observations from the experiment:

Students identify and describe how ingredients change through mixing and cooking using the senses.

EQUIPMENT AND MATERIALS

- 2 dozen eggs
- saucers
- forks
- iceblock sticks
- plastic trays
- books
- electric frypan
- plastic gloves
- water
- vinegar
- toothpicks
- paper towel
- stove saucepan
- glass jars with lids
- seashells

SAFETY

- Check that no students have allergies to eggs to ensure that there is no possibility of students suffering anaphylactic shock.
- Make students of this age group aware of the potential dangers of electric equipment and of the heat generated from an electric frypan
- Only teacher and teacher aides will use the frypan.
- Ensure that all students have a clear view without being too close to the heating element.
- Ensure that in the cooking for tasting component of the activities that students wear plastic gloves, have their hair tied back and are aware of basic food hygiene practices in the preparation of food.
- Stove and frypan to be used by teacher and teacher aides.
- Students to be seated behind desks away from stove but still able to see what is being done.
- Cooked eggs to be cooled sufficiently before being given to students for exploring properties.
- Hot water and hot utensils only to be handled by teacher and teacher aide.

PREPARATION REQUIRED

The only preparation that is required is for the teacher to prepare a list of items that need to be acquired for the experiments. All of these items are readily accessible from the supermarket.

LESSON STEPS

- See safety steps above
- Complete risk assessment forms
- Stove and frypan to be used by teacher and teacher aides.
- Students to be seated behind desks away from stove but still able to see what is being done.
- Cooked eggs to be cooled sufficiently before being given to students for exploring properties.
- Hot water and hot utensils only to be handled by teacher and teacher aide.

METHOD

- Students work in groups of four at an activity station.
- Some activities will be teacher led and students will follow instructions lock step.
- Other activities will allow students to manipulate, explore and discuss their activities independently.
- Activities involving heat will be modelled by the teacher and teacher aides.

FURTHER INFORMATION

Core Content

Types of materials

- solid, liquid

Properties of material

- taste, odour, colour
- transparent, opaque
- density – light/heavy
- hardness, softness

Nature of change

- fast/slow
- requires heat

Causes of change

- heating /cooling / cooking
- mixing, combining

Visit www.raci.org.au for further chemistry education resources