



Motto  
"Not for self but for others"

# Aspley State High School AIMS

**Subject:** Year 8  
**Identification:** Extended Experimental Investigation  
**Unit:** Power Of One  
**Topic:** Do Rotten eggs float?

**Date Issued:**  
**Date Due:** Week 8  
**Time:** 2 weeks

**Name:** \_\_\_\_\_

**Class:** \_\_\_\_\_ **Teacher:** \_\_\_\_\_

The Power of One egg..... How do you tell the difference between a fresh egg and a rotten egg? You can ask Mum, Nana, neighbour, Home Ec teacher etc.  
But can we prove it using maths and science.

## Part A

You will be given four eggs with specific labels A, B and C are known and labelled. D is unknown and **you will have to determine the type of egg.**

- A. One fresh
- B. One rotten
- C. One boiled
- D. One unknown.

## Task One: Estimate of Length

1. Construct one data table that records an estimate of the following.
  - a) Height of each egg(mm)
  - b) Width of each egg (mm)
  - c) Circumference of each egg (mm)
  - d) Length of egg carton (cm)( Hand in your estimates to your teacher)

## Task Two: Actual Length

2. Construct another data table that records actual measurement of the following.
  - e) Height of each egg(mm)
  - f) Width of each egg (mm)
  - g) Length of egg carton (cm)(Hand in with assignment)

## Task Three: Mass, Volume and Density

3. Construct a data table of mass, volume and density for each egg.
4. Use the table of densities to construct a bar graph using excel to display your results.



## Part B

### Task Three: How does the Density change as the fertilized egg develops?

Your group will be given one fertilized egg.

Fertilised eggs need special care to maintain the growth of the embryo. You will be given specific instructions by your teacher.

If this egg is maintained under correct conditions it will hatch into a fluffy chick in 21 days.

1. Calculate the volume of the egg.
2. Construct a data table of the mass of the egg each day
3. Construct a line graph of the mass of the egg for each day
4. Construct a line graph for the density of the egg for each day

### Report Format

The purpose of this experiment is to use science and maths to investigate the properties of density and egg development.

### Introduction

What is the definition of density? Give three examples explaining how density is used in everyday life

- I. nature and the characteristics of animals
- II. Work and industry
- III. Sport and recreation

### Results

#### 4 data tables

Data Table - One	Estimating lengths
Data Table – Two	Actual Measurements
Data Table –Three	Density of Eggs A,B,C,D
Data Table – Four	Density of fertilized egg.

#### 3 Graphs

- Graph One - Density of Eggs A,B,C,D
- Graph Two - Mass of the fertilised egg for each day
- Graph Three - Density of the fertilized egg for each day

**Calculations** - are to be included at the end of the assignment in the appendices

### Conclusions

Part A – How can you use maths and science to distinguish between the three types of eggs ?

Part B – How has the Density of the developing fertilized egg changed over the course of 21 days?  
Did you expect this? Why has the density changed?

Part C – How can you explain why some eggs float and others do not? Can this be used to indicate freshness? Use the data obtained in this assignment to justify your explanations.

Aspley State High School  
Applications in Mathematics and Science

Marking Criteria – Do Rotten Eggs Float?

Task Reference	Assessable Element	Descriptor	Standards					Maths	Science
			A	B	C	D	E		
A1.	KU(7)	Measurement	The student has demonstrated a very high ability to consistently and accurately estimate length in mm and cm.	The student has demonstrated a high ability to consistently estimate length in mm and cm.	The student is able to estimate length in mm and cm	The student is able to estimate length in cm.	The student has little ability to estimate length.		
A2.	KU(7)	Measurement	The student has demonstrated a very high ability to consistently and accurately measure length in mm and cm.	The student has demonstrated a high ability to consistently measure length in mm and cm.	The student is able to measure length in mm and cm	The student is able to measure length in cm.	The student has little ability to measure length.		
A3.	KU(9)	Measurement	The student demonstrates a very high ability to accurately record and derive measurements from collected data.	The student demonstrates a high ability to accurately record and derive measurements from collected data.	The student demonstrates a satisfactory ability to accurately record and derive measurements from collected data.	The student demonstrates a satisfactory ability to accurately record measurements.	The student demonstrates an ability to record measurements.		
A3.	Communicating (9)		The student is able to use ICT's to organise and display data in a meaningful and mathematically correct manner. All conventions for graphing are evident.	The student is able to use ICT's to organise and display data in a meaningful and mathematically correct manner. Most conventions for graphing are evident.	The student is able to use ICT's to organise data in a meaningful and mathematically correct manner. Graph is constructed by hand.	The student is able to organise data in a meaningful and mathematically correct manner. Graph is constructed by hand.	The student has collated some data.		
B1.	KU(9)	Measurement	The student demonstrates a very high ability to accurately record and derive measurements from collected data.	The student demonstrates a high ability to accurately record and derive measurements from collected data.	The student demonstrates a satisfactory ability to accurately record and derive measurements from collected data.	The student demonstrates a satisfactory ability to accurately record measurements.	The student demonstrates an ability to record measurements.		

Task Reference	Assessable Element	Descriptor	Standards					Maths	Science
			A	B	C	D	E		
B1.	Communicating (9)		The student is able to use ICT's to organise and display data in a meaningful and mathematically correct manner. All conventions for graphing are evident.	The student is able to use ICT's to organise and display data in a meaningful and mathematically correct manner. Most conventions for graphing are evident.	The student is able to use ICT's to organise data in a meaningful and mathematically correct manner. Graph is constructed by hand.	The student is able to organise data in a meaningful and mathematically correct manner. Graph is constructed by hand.	The student has collated some data.		
Report Introduction	Communicating	Science	Clear and accurate communication using illustrations, representations and terminology.	Coherent and accurate communication using illustrations, representations and terminology.	Sound communication using illustrations, representations and terminology.	Disjointed communication using some illustrations, representations and terminology.	Unclear communication using some illustrations and representations and terminology.		
	Applications	Investigating	Discerning analysis and evaluation and to draw well-reasoned conclusions.	Logical analysis and evaluation to draw reasoned conclusions.	Relevant analysis and evaluation to draw credible conclusions.	Narrow analysis and evaluation to propose obvious conclusions.	Cursory analysis and evaluation to propose conclusions		
Results	Collection, Organisation and Representation of data		The student is able to use ICT's to organise and display data in a meaningful and mathematically correct manner. All conventions for graphing are evident.	The student is able to use ICT's to organise and display data in a meaningful and mathematically correct manner. Most conventions for graphing are evident.	The student is able to use ICT's to organise data in a meaningful and mathematically correct manner. Graph is constructed by hand.	The student is able to organise data in a meaningful and mathematically correct manner. Graph is constructed by hand.	The student has collated some data.		
	Applications of algorithms.		The student is able to consistently and accurately apply algorithms and procedures without error	The student is able to consistently and accurately apply algorithms and procedures without minor errors	The student is able to select and apply algorithmic procedures.	The student is able to identify the algorithmic procedure but has difficulty applying it.	The student has difficulty in identifying suitable algorithms.		
Conclusion	Application of Mathematic and Scientific principles to explain concepts of mass/density change.		Perceptive reflection on the science investigation, values and mathematical reasoning within the learning experience.	Informed reflection on the science investigation, values and mathematical reasoning within the learning experience.	Relevant reflection on the science investigation, values and mathematical reasoning within the learning experience.	Superficial reflection on the science investigation, values and mathematical reasoning within the learning experience.	Cursory reflection on the science investigation, values and mathematical reasoning within the learning experience.		
							Overall Result		