

Name: _____



KS3 Homework Booklet



Homework 1 (page 2)	Key science terms - Learn the spelling of the key term and their definition. Use each of the terms in an original sentence (do not just copy the definition) and bring this to your lesson and stick into your book.
Homework 2 (page 3)	Skills in Science - Complete the questions on skills in science and bring this to your lesson and stick into your book.
Homework 3 (page 4)	Practical Science: Chemical Change Complete task A - the practical into chemical change and produce a mini-science report. Or Complete task B a non – practical version by watching the video and completing the questions
Homework 4 (page 5)	Key science terms - Learn the spelling of the key term and their definition. Use each of the terms in an original sentence (do not just copy the definition) and bring this to your lesson and stick into your book.
Homework 5 (page 6 - 8)	Skills in Science - Complete the questions on skills in science and bring this to your lesson and stick into your book. Q1 and 2 must be completed, Q3 the challenge questions, are optional.

Homework 1 - Key Science Terms 1

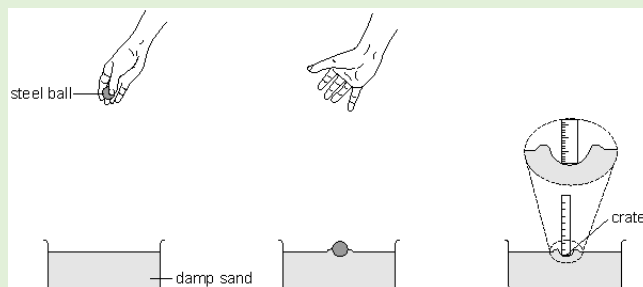
Learn the spelling of the key term and their definition. Use each of the terms in an original sentence (do not just copy the definition) and bring this to your lesson and stick into your book.

Word	Meaning
Variable	These are physical, chemical or biological quantities or characteristics.
Categoric variables	have values that are labels
Continuous variables	can have values (called a quantity) that can be given a magnitude either by counting or by measurement
Independent variable	The variable for which values are changed
Dependent variable	The variable of which the value is measured for each and every change in the independent variable.
Control variable	A variable which may, in addition to the independent variable, affect the outcome of the investigation and therefore has to be kept constant or at least monitored.

Homework 2 – Skills in Science

Complete the questions:

Jack and Aneesa dropped a steel ball into trays of damp sand. They measured the depth of the craters made by the steel ball.



Jack's Results

Height the ball was dropped from (cm)	Depth of crater (cm)		
	First Trial	Second trail	Mean
10	1.1	1.2	
20	1.4	1.5	
30	1.6	1.6	
40	1.8	1.7	
50	2.0	2.1	

Aneesa's Results

Height the ball was dropped from (cm)	Depth of crater (cm)
10	0.8
20	1.4
30	1.5
40	1.8
50	2.1

1. Calculate the mean for Jack's set of results.
2. Explain why we repeat results and calculate a mean in science investigations?
3. What was the independent variable of this investigation?
4. What was the dependent variable of this investigation?
5. Name two control variables for this investigation?
6. Is the data produce categoric or continuous? Justify your answer.
7. Why was Jack's investigation better than Aneesa's?
8. Describe the pattern shown between the height the ball was dropped from and the depth of the crater?

Homework 3 - Practical Science - Chemical Change

Complete task A - the practical into chemical change and produce a mini-science report.

Or

Complete task B a non – practical version

Task A - Chemical change

1. Find some old copper coins. Describe what they look like.
2. Into a cup/bowl pour some white wine vinegar (or whatever vinegar you have) then add 1 tsp of salt and give a good mix.
3. Into a second cup pour some water.
4. Place your copper coin in the vinegar salt solution and leave for 45 seconds.
5. Use a spoon to get your copper coin out
6. Drop half of the coins into the water and count to 20, remove and rub dry.
7. Place the other half of the coins on some kitchen roll, allow them to dry on their own but with no rinsing or rubbing. Leave for approximately one hour.
8. Observe the difference.

In your mini-science report:

1. State the independent variable of this investigation.
2. State the dependent variable of this investigation
3. State the control variable of this investigation
4. State the results, which should be description of what the coins looked like before and after the experiment with a diagram/photograph of the coins.

Extension – Research to explain your scientific findings. You could also extend the practical and add other types of metal e.g. iron nail and record your findings

Task B – Non-practical homework for chemical change

[\(12\) CLEAN A PENNY WITH VINEGAR Experiment - YouTube](#)

Watch the video and answer these questions:

1. State the independent variable of the investigation into cleaning copper coins
2. State the dependent variable the investigation into cleaning copper coins
3. State any control variable for the investigation into cleaning copper coins
4. State the results, which should be description of what the coins looked like before and after the experiment with a diagram/photograph of the coins.
5. Explain the results

Homework 4 - Key Science Terms

Learn the spelling of the key term and their definition. Use each of the terms in an original sentence (do not just copy the definition) and bring this to your lesson and stick into your book.

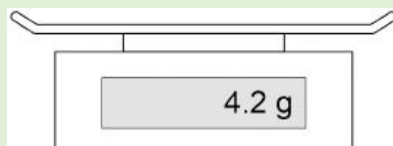
Word	Meaning
Systematic error	These cause readings to differ from the true value by a consistent amount each time
Zero error	An indication of a false reading measuring system, therefore systematic uncertainty
Random error	These cause readings to be spread about the true value, in an unpredictable way each time
Repeatable	The original experimenter repeats the investigation using same method and equipment and obtains the same/similar results .
Reproducible	The investigation is repeated by another person , or by using different equipment or techniques, and the same/similar results are obtained .
Anomalies	A value that doesn't fit the pattern

Homework 5 – Skills in Science

Complete the questions:

Q1 A student determined the density of a cube made of bronze. The student used a balance to measure the mass of the bronze cube. **Figure 1** shows the balance before the cube was added.

Figure 1



- (a) What type of error is shown on the balance?

(1)

- (b) How could the student get a correct value for the mass of the cube from the balance?

(1)

Q2 This question is about the reaction between hydrochloric acid and sodium hydroxide solution.

A student investigated the effect of changing the volume of sodium hydroxide solution on the temperature change during the reaction.

This is the method used.

1. Measure 30 cm³ of hydrochloric acid into a polystyrene cup.
2. Measure the temperature of the hydrochloric acid.
3. Add 5 cm³ of sodium hydroxide solution.
4. Stir the mixture.
5. Measure the highest temperature the mixture reaches.
6. Repeat steps 1 to 5 three more times and calculate the mean temperature change.
7. Repeat steps 1 to 6 with different volumes of sodium hydroxide solution.

- (a) What **two** pieces of equipment should be used in this investigation?

Tick (✓) **two** boxes.

Balance

☐

Measuring cylinder

☐

Ruler

☐

Stopclock

☐

Thermometer

☐

(2)

Homework 5 – Skills in Science Continued

Q2 (b) The table below shows the results for one volume of sodium hydroxide solution.

Temperature change in °C				
Test 1	Test 2	Test 3	Test 4	Mean
7.0	7.2	6.6	6.8	X

Calculate value X in the table above.

X = _____ °C

(2)

(c) State the range shown in the table

(1)

(d) Which type of error is reduced by repeating the tests and calculating the mean?

Tick (✓) **one** box.

Random

☐

Systematic

☐

Zero

☐

(1)

(e) Does the table of data show repeatability?

(1)

(f) State the independent variable of this investigation.

(1)

(g) State the dependent variable of this investigation.

(1)

(h) State a control variable of this investigation.

(1)

Homework 5 – Skills in Science – Challenge Questions

Complete the questions:

Q3 Caffeine is a drug that decreases reaction time. A group of sixteen students investigated the effect of caffeine on reaction time.

The students were all 15-year-old girls.

The group was divided into 8 pairs of students.

This is the method used.

1. Student **A** starts two stopwatches at the same time.
2. Student **A** then gives one of the stopwatches to Student **B**.
3. Student **A** says “stop” at the same time as stopping her stopwatch. Student **B** stops her stopwatch as quickly as possible after Student **A** says “stop”.
4. The difference in time shown on the two stopwatches is recorded. This is the reaction time of Student **B**.
5. Student **B** drinks a caffeinated drink.
6. The students wait 15 minutes and then repeat steps 1 to 4.

- (a) Suggest **one** control variable the students should have used in the investigation.

Do **not** refer to age or sex in your answer.

(1)

- (b) Suggest **two** sources of random error when using this method to measure a person's reaction time.

(2)

The table below shows the results.

Student pair	Decrease in reaction time after drinking the caffeinated drink in seconds
1	0.039
2	0.021
3	0.027
4	0.041
5	0.022
6	0.036
7	0.024
8	0.097

(c) The students decided that one result was anomalous. The students then calculated that the mean decrease in reaction time was 0.030 seconds.

- I. State which student pair produce an anomalous result.
- II. Describe how the students calculated the mean decrease in reaction time.