Use this sheet to help plan your investigation. Aim to do your best!

# http://www.anet.sk/coldex/logo2.gif Working Scientifically

# Investigations

**Investigate how different amounts of urea will affect the temperature of a reaction.**

Urea is a colourless, crystalline compound that undergoes an **endothermic** reaction when dissolved in water. This means that when it is mixed with water, it sucks in heat from the surrounding area, making it seem very cold.

A company wants to use this product, and sell it as an icepack under the name of **COLDEX**. The company wants to store the icepack at room temperature and when mixed with Urea reach a temperature of 15° C. the company needs you to test the compound then record and present the data to them to see if it is a viable option. They make you aware that it is only a viable option to produce this product if no more than 5 grams of Urea are used in the product.

You will need to design an investigation which you are to conduct in a group, using the scientific method, to test the effect of different amounts of urea on the temperature of the reaction. Come up with all parts of the investigation, including:

1. Hypothesis
2. Materials

* Beakers
* Measuring Cylinder
* Thermometer
* Scales
* Urea (Coldex)
* Spatula

1. Method (so someone else could follow it)
2. Variables; independent, dependent, control
3. Table for results

**Note**: After obtaining the results in class, you will then write up your investigation as an individual the following lesson. This will be assessed.

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

**Group members:**

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**Date:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Title:** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Aim:**

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**Prediction:**

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**Hypothesis:**

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**Variables:**

* Independent:

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* Dependent:

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* Controlled:

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**Materials:**

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**Method:** (Use detailed numbered steps/instructions)

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**Results:** (Draw the table that you will use to collect your results here)

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**Graph:** (Draw the graph that you will represent your results)



Key Words for Investigations

**Title:** A title is a name that helps you introduce your report

**Aim:** What you are trying to find out. This is the question you will answer during the investigation.

**Hypothesis:** What you think is going to happen? This is a general statement that you can test through this investigation.A good hypothesis says what variable you are changing and what the effect will be. It should be written as an “If…then…” statement. E.g.; if fertilizer is added to plants the growth will increase

**Independent Variable:** What is the one part of your investigation that you are going to change deliberately? E.g.; if you are investigating how fertiliser affects plant growth then you are going to be changing the amount of fertilizer between at least two plants.

**Dependent Variable:** What will be measured as you do the investigation? E.g.; if you change the amount of fertilizer then what you would be measuring is the plant growth in millimetres or just by observations.

**Controlled Variables:** The parts of an investigation that are kept the same; to make the investigation fair.

**Apparatus and Materials:** What equipment you will need? Make a list.

**Method or Procedure:** A series of numbered steps explaining in specific detail how to complete your experiment.

**Results Table:** In this area you draw up the table to record all the results. If possible there should also be a column to calculate any averages.

**Analysis of Results/Discussion:**

What do your results tell you?

Are there any patterns or trends in your results? Try to use some Science ideas to help explain what happened.

**Conclusion:**

What did you find out about the outcome being investigated?

Was your outcome different to your hypothesis? How is it different?

**Evaluation:**

Did you experience any difficulties doing this investigation? What were they?

Explain how you could improve this investigation, e.g. fairness and accuracy

Are there any further investigations that could come from this investigation?