



FANCY PACKS FOR THE SWEETS PANTRY DESIGN WORKBOOK

Name: _____

Other group members: 1. _____

2. _____

3. _____

4. _____

Group Number: _____ Class: _____



THINKING SPACE

... drawings, diagrams, observations, notes, reflections ...



THINKING SPACE

... drawings, diagrams, observations, notes, reflections ...



3. Individually, think of sweet packs you know about or have seen before. Describe them below (in words, drawings)

The Sweets Pantry Competition

The *Sweets Pantry* wishes to improve the packaging of its different sweets products. Some customers have complained that the packs are boring, don't have enough sweets in them, and often break if they are not careful with them.



The owners of the *Sweets Pantry* have therefore decided to have a competition to see who can create a new sweets pack that customers will like. These are the rules for the competition:



- The packs must be attractive.
- They must hold between **250 grams and 450 grams**.
- The packs can be any shape and size. They can be bags, boxes, cylinders, or whatever you like.
- You must choose materials from those shown but you cannot spend more than **\$15.00** in buying your materials



Imagine you are entering the *Sweets Pantry* competition. Here is the range of sweets the Pantry sells.

Range of sweets sold at the Sweets Pantry

<i>Sweets</i>	<i>Weight (gram) per unit (item)</i>
Chocolate Drops	30 grams per item
Chocolate Twists	25 grams per item
M&Ms	20 grams per item
Marshmallow Twists	10 grams per item
Rock Candy Bites	50 grams per item
Crazy Twirls	15 grams per item
Candy Crinkles	40 grams per item
Lollipops	45 grams per item

List of Materials

<i>Material</i>	<i>Cost per sheet (\$)</i>
Paper	\$1.00
Plastic Sheet	\$4.00
Vinyl	\$6.00
Cellophane	\$3.00
Cardboard	\$4.00
Baking Paper	\$2.00
Aluminium Foil	\$4.00
Foam	\$6.00
Bubble Plastic	\$5.00
Wrapping Paper	\$5.00
Fabric	\$8.00

Investigation

Here is what you have to do in entering the competition:

First, make some decisions:

- Decide what **type of pack** you will design and make.
- Decide what **types of sweets** your pack will hold. It can hold more than one type of sweet. Decide on the **number of each sweet type**.
- Based on your selection of types of sweets and number of each sweet type, **calculate the weight (in grams)** your pack will hold.
- Decide what **types of materials** your pack will hold. It can hold more than one type of material. Decide on the **number of each material type**.
- Record your decisions in your workbook.

Second, design your pack:

- **Design** your own pack by doing a **labelled drawing** that shows all the measurements and shapes needed in making the pack, and the materials you plan to use. Do your own design in your workbook. Keep a record of all of the materials you will be using.

Third, make some more decisions:

- Look at each group member's design
- As a group, decide which design your group will follow.
- Why did you choose that design? Record your answers in your workbook.
- Follow your chosen design and build your group pack using the materials supplied. Remember! You only have **\$15.00** to spend on your materials.
- The packs need to be strong enough to hold the quantity of sweets you have decided on. You will be able to check this by using the scales *after* you have made your pack.

Next, answer the questions in your workbook.

- How much did your pack hold? How close were you to your prediction?
- Was your pack strong enough to hold your sweets?
- How would you rate your design? Place a mark *anywhere* on the line below:

Poor

Fair

Excellent

- Why did you rate your design this way?
- What *changes* would you make to improve your sweets pack?
- How were you using maths and science in designing and creating your pack?

Note: For this competition, you will be provided with objects that represent sweets

OUR TASK: THE SWEETS PANTRY COMPETITION

INSTRUCTIONS AND RULES:

- You will be **working both individually and in groups** of 3 to 5.
- Your package is to be made from a **selection of available materials**. Your pack is to be designed to be **attractive**, and able to hold between **250 grams to 450 grams of “sweets”**
- You will *individually* decide on **type of pack, type of sweet types and number of each sweet type**. You will then calculate the **weight** of sweets your pack will hold for the competition, and **record** your decisions in your workbook. You will then **draw and label** the pack you wish to design, and decide on the **materials** you wish to use. These will also be recorded in your workbook.
- In *Groups*, you will study each other’s designs and decide on which design to implement. You will record your reasons to implement the selected design in your workbooks.
- In Groups, you will then use the selected design and build the group pack using the materials supplied. Note that your group has a **\$15.00** limit to spend on materials.
- You will **measure the weight of sweets your pack can hold** using a weight scale. This will be done by weighing each batch of sweets before placing them into your pack.
- We will not have time for you to redesign your pack to improve it, but you will answer a question on how you might redesign it to improve it.
- After your **Group design**, you will be given time to answer questions about the design of your pack and how successful it was.



SCIENCE EXPERIMENT

You will be testing a range of materials for their properties. Use the table below to complete your observations.

Question: (What are you trying to investigate? Your question should be worded to allow you to answer with a 'yes' or 'no' response.)

If I change _____ will it
affect _____?

Aim: (What are you aiming to find out by completing this investigation? Your aim should begin with 'To...')

To _____

Hypothesis:

I predict _____
because _____

Materials:

- cardboard
- cellophane
- wrapping tissue
- baking paper
- fabric
- alfoil
- foam/bubble plastic

Fair Testing Procedures: (Use this table to record 'Cows Moo Softly'. List as many things as you can in the third column)

<i>Change something</i>	<i>Measure something</i>	<i>Keep everything else the same</i>

Procedure:

- Each group tests 4 materials.
- Test one material for all of the properties, then do the next one, then the next etc.....
- Record your observations in the table provided by drawing and describing what happened for each test.
- At the bottom of the observation sheet, describe the properties of each material.
- Answer the question at the bottom: Can the material be recycled or re-used?

Results: (Record your results of your investigation in this table)

Name of material 1:	
Describe the colour.	
Describe the texture.	
Draw and describe what happens when it was scrunched.	
Draw and describe what happens when it was twisted.	
Draw and describe what happens when it was torn.	
Draw and describe what happens when it was stretched. (elasticity)	
Draw and describe what happens when it was held up to light. (transparency)	

Name of material 2:	
Describe the colour.	
Describe the texture.	
Draw and describe what happens when it was scrunched.	
Draw and describe what happens when it was twisted.	
Draw and describe what happens when it was torn.	
Draw and describe what happens when it was stretched. (elasticity)	
Draw and describe what happens when it was held up to light. (transparency)	

Name of material 3:	
Describe the colour.	
Describe the texture.	
Draw and describe what happens when it was scrunched.	
Draw and describe what happens when it was twisted.	
Draw and describe what happens when it was torn.	
Draw and describe what happens when it was stretched. (elasticity)	
Draw and describe what happens when it was held up to light. (transparency)	

Name of material 4:	
Describe the colour.	
Describe the texture.	
Draw and describe what happens when it was scrunched.	
Draw and describe what happens when it was twisted.	
Draw and describe what happens when it was torn.	
Draw and describe what happens when it was stretched. (elasticity)	
Draw and describe what happens when it was held up to light. (transparency)	

Discussion:

Which of the materials you tested could be recycled or re-used? How do you know?

Which materials according to your experiment, do you think would be most suitable to build the sweets pack?

Explain your reasons for choosing this material. Refer to results table to support your reasons. Make sure you compare the materials to one another:

Was it a fair test? Why?

What could be another experiment you could implement, that may teach you more about the topic? Write it as an investigable question.

Is there anything else you learnt/ would like to share?

Conclusion:

My hypothesis was supported/ unsupported (circle one)
because

Question:

Identify when and why or how package designers, builders or engineers use science to select appropriate materials for their work:

2. Your pack can hold more than one type of sweets. List the **types of sweets** and the **number of each sweet type** you want your pack to hold. Refer to the list of sweets on page 7:

3. How many **grams of sweets** will your pack hold? (depending on the type of pack, type of sweets and materials used to make the pack, you should indicate a quantity between 250 grams and 450 grams)

_____ (grams)

4. Your pack can hold more than one type of material. Describe the **types of materials** and the **number of each material type** you plan to use to make your pack (refer to the list of materials in Page 8 and the science experiment results):

5. Why have you chosen these materials? What **properties of these materials** contribute to them being a good choice? (refer to the science experiment results):

6. Did you include any ideas about **sustainability** in the design of your pack?



7. Do a sketch of your proposed pack and label your drawing showing the materials you plan to use. Indicate all measurements. Keep a record of all materials you will be using.

GROUP DESIGN

You will only make one pack per group.



1. **Look** at each group member's design.
2. **Discuss** among yourselves and **decide** which design your group will follow.



3. Individually record below why your group has decided to choose the selected design. Provide the **group member's name** and the **reason why**

We have decided to choose _____ design

because _____



THINKING SPACE

... drawings, diagrams, observations, notes, reflections ...



4. **Build** your group pack. Follow the **selected design** and **proposed materials** belonging to the group member whose design was selected.

Remember that your group only has **\$15.00** to spend on materials. Your pack should be **strong** enough to hold the quantity of sweets decided on in the selected group member's workbook. Your pack should also be **attractive**.



Follow safety instructions as explained by your teachers when handling materials and equipment.



5. **Test** your pack. You will be testing your group pack for strength. You will be dropping your pack and see if it breaks.

Decide as a group how you would test your pack. Record the results of your testing in a clear and orderly fashion, so that they make sense to others.

a. Questions that we are investigating:

b. Variables that we are changing:

c. Variables that we are measuring:

d. Variables that we are keeping the same:

e. Predict how your test will go for the different test categories:

f. What we found out (**Record your Test results below**):



6. **Record** your observations below by answering each question.

a) How much did your pack hold?

b) Was your pack strong enough to hold your sweets after the fair test?

c) How close were you to your prediction?

- (f) What *changes* would you make to improve your sweets pack? (Refer to your science experiment on properties of material and ideas of sustainability). **Give reasons why.**

- (g) What Maths and Science skills and knowledge were you using to design, build and test your pack?



THINKING SPACE

... drawings, diagrams, observations, notes, reflections ...

We used this pack size, shape and material:

We selected the following sweets for our group pack (Write name of each Sweet Type and quantity of each Sweet type):

Our group pack was able to hold _____
grams of sweets.