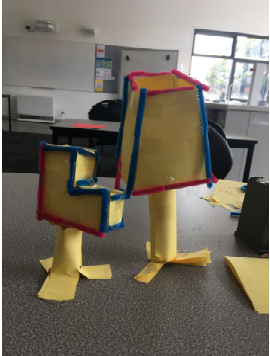


Name: \_\_\_\_\_

## Year 7 Lampshade Project

You are to design a lampshade. You will construct your lampshade out of pipe cleaners (the frame) and one A4 sheet of paper.



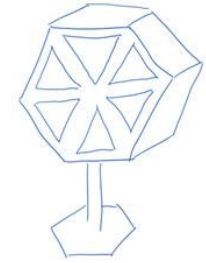
← Here are two examples of lampshades designed by your Year 7 teachers.

For those looking to challenge themselves through this task, the following table details what makes a lampshade expensive.

I wonder who can make the most expensive lampshade...

Note that each incorrect measurement or calculation will decrease the value of your lampshade by 10% (ie three errors is 30% off). Consider carefully how ambitious you will be!!

Basic Lampshades sell for \$1000		
<b>Shapes in your lampshade</b>	+ \$400 for every triangle contained in your lampshade (maximum 10)	+ \$700 if your lampshade contains a trapezium
	+ \$1500 if your lampshade contains a circle / semi-circle	+ \$2500 if your lampshade contains a cone
<b>Use of materials</b>	+ \$2000 if the surface area of your lampshade is over 500cm <sup>2</sup> (approx. 80% of an A4 sheet)	+ \$2000 if the length of pipe cleaner required is between 30 and 45 cm
<b>How pretty</b>	+ \$1000 if your lampshade is aesthetically pleasing	+ \$3000 if it takes your teacher's breath away (has to be very, very special for this!)



## Part 1: Designing your lampshade

Here are some options for the basic design of your lampshade 7. You may choose one of these or create your own.

Now it's your turn, design your lampshade in the space below.

A large, empty rectangular box with a thin black border, intended for a student to draw their own lampshade design.

## Part 2: Drafting your panels

1) Roughly sketch **every** panel of your lampshade in the space below. Include relevant dimensions.

- **Remember**, your panels must all fit within one A4 sheet of paper.
- Cut out and measure sample shapes using a scrap piece of paper to help you work out the dimensions
- Hold your sample shapes together to make sure your design works.

### Part 3: Work out the cost of your panels

Imagine that your piece of A4 paper is fancy and costs \$0.3 per  $\text{cm}^2$ . Let's work out how much will it cost to make your panels.

1) What is the total area of paper needed for your design?

Hint: You may need to break the panels into familiar shapes like triangles and rectangles.

a. Include diagrams and calculations for each unique shape in the space below.

b. Work out the total area of the panels in your lampshade.

2) The paper material costs \$0.3 per  $\text{cm}^2$ . How much will it cost to make your panels?

#### Part 4: Creating your frame

1) What is the perimeter of each panel?

Include diagrams and calculations for each unique shape in the space below.

**\*\*All shared edges will only require one pipe cleaner\*\***

- 2) Work out which sides of which panels will need pipe cleaners and highlight these sides on your diagram from Part 2.
- 3) What is the total length of pipe cleaners you will need?
- 4) Calculate the sum of your answers in Part 4 Question 1.
- 5) Explain why your answers to Q3 and Q4 are different.
- 6) Pipe cleaners are also super fancy and cost \$0.5 per cm. What is the total cost of the pipe cleaners required for your design?

## **Part 5: Creating your Lampshade**

- 1) Collect one A4 sheet of paper and at most 4 pipe cleaners.
- 2) Create your lampshade out of paper, pipe cleaners and sticky tape.
- 3) Once you've finished your lampshade, collect one more piece of paper to make your base.
- 4) Print out a photo or draw a picture of your finished product here.

## **Optional Extension Activities**

1. Create a 3D shape as a base for your lamp using a net.
2. Create your lampshade out of other materials
3. Design a lampshade with the exact same total area without using any of the shapes you did in your first design.
4. Work out the exact cost of your lampshade. A ream of 500 sheets of paper costs \$5.60 and 1000 pipe cleaners costs \$19.95
5. Design anything you like using 2 A4 sheets of paper and 4 pipe cleaners