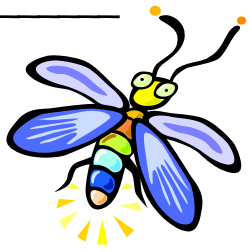
Student's name: _____ Group:_____

Design process

Mechanical Bugs





Identify the problem

My design:
Create an imaginary, articulated insect, using recycled materials.



Outline the problem

SPECIFICATIONS BOOKLET

The insect must:
- be made from one of the containers put at your disposal;
- be fitted with a connecting rod and crankshaft mechanism;
- possess the characteristics that you will have drawn (antennae or not, wings or not, etc.);
- be carried out using the materials and equipment put at your disposal.



Simmer your ideas

Study of the connecting rod and crankshaft mechanism

What is a connecting rod? What is a crankshaft?

Station 1: Place the boxes on the desk so as to hide the mechanism. Turn the crankshaft in milk cartons A, B and C. For each of the situations, write the letter of the corresponding box and explain what is happenning.

Carton	What is happenning?	Explanation
☐	The crankshaft rubs on the desk.	_____ _____
☐	The crankshaft rubs on the milk carton.	_____ _____
☐	The crankshaft turns easily.	_____ _____

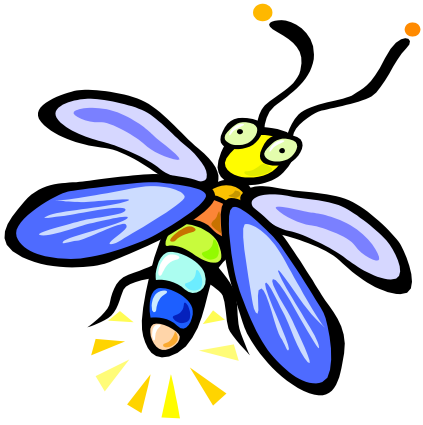
Station 2: Turn the crankshaft and observe the connecting rod (straw). What is happenning? Explain.

Carton	What is happenning?	Explanation
D		
E		

Station 3: Turn the crankshaft and observe the straw. Which part(s) of the body could you make move in each case?

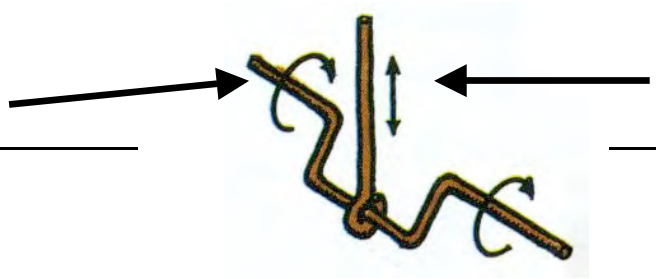
Carton	Which part(s) could move?			
F	antennas	head	wings	stinger
G	antennas	head	wings	stinger
H	antennas	head	wings	stinger

Station 4: To make your crankshaft, follow the steps described in the file called "Folding techniques for the crankshaft".





Now that you have studied the mechanisms of the connecting rod and crankshaft, place the words "connecting rod" and "crankshaft" in the correct boxes on the following diagram.



_____ _____

BACK TO THE WHOLE GROUP: Place the words in the correct spaces.

length - legs - short - connecting rod - small - rub - connecting rod

1. My crankshaft must not _____ on the bottom of the container. I have to think about where I will place my holes to insert the crankshaft.	**2.** The _____of my connecting rod can not be too _____ otherwise it will not be guided by the hole.
3. I can't cut the _____ too short or the part of my insect that moves will be blocked.	**4.** I start by making a _____ hole in my container to let the connecting rod out. If the connecting rod blocks, I can make the hole bigger.
5. When I affix my head or wings to the connecting rod, I have to ensure that the _____ is long enough.	**6.** If the crankshaft rubs on the table, I can put longer _____ on my insect.

Picture drawn from: KASICKI, Ollie. The Ressources and projects Book – A student guide to design and technology, Delmar Publishers inc., p. 37



Carry out a solution

You are now ready to make your insect. Go to page 4, the instructions for making it are there.



Make a test

What works well:

_____

_____

_____

What doesn't work:

_____

_____

_____

Aspects to be improved (sketch or explanations):



Evaluate and improve the solution