

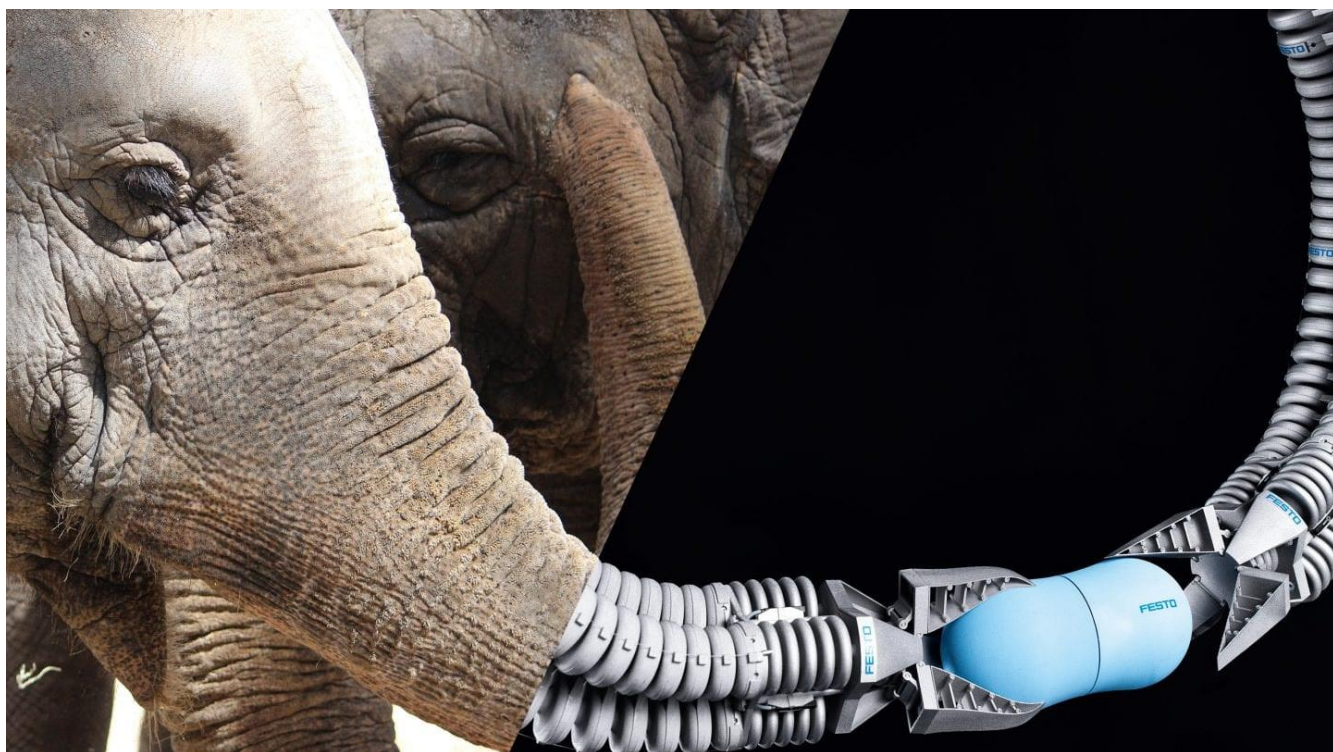
Biomimicry Automata

Year 7 Homework Booklet



Pupil:

Class:



Week	Task title	Summary	Page	Date due
1	Research	Use the set of 'How does nature...' questions to research and describe natural processes	1	
2	Product Analysis	Complete a detailed product analysis.	2	
3	Drawing Techniques	Draw front, side and top elevations.	3	
4	Questionnaire	Write a questionnaire to gain feedback on an automata design.	4	
5	Drawing Techniques	Draw objects using oblique technique.	5	
6	Tool Identification	Identify the tools used with in the production of your automata.	6	
7	Practical Mathematics	Complete a series of questions that highlight the practical applications of mathematics.	7-8	
8	Risk Assessment	Write a risk assessment for activities you do outside of school.	9-10	
9	Life Cycle Analysis	Evaluate the environmental impact of a toy.	11	

Homework should be completed each week and either submitted on your Google Classroom class or written out and handed in to your teacher on the date it is due. Any issues with the homework must be addressed with your teacher before the due date.

Week 1: Research

Use the Ask Nature website to research how nature does each of the following things. There are many examples available on this website so just pick one way it does each of these things.

Link also available on Google Classroom.

https://asknature.org/?s=&page=0&hFR%5Bpost_type_label%5D%5B0%5D=Biological%20Strategies&is_v=1

How does nature protect from physical harm.

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How does nature get, store, or distribute resources.

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How does nature make or modify.

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How does nature move or stay put.

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How does nature process information.

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How does nature protect from physical harm.

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Week 2: Product Analysis

Complete a product analysis on the product in the centre of the page. You should use the questions on the template/help sheet to guide you on what to write. The more detail you can give the better; you may even need to research the product a little to help you.

Who do you think this product is designed for/would buy it?

What are the dimensions or sizes of this product?

What is the function of this product?



How much does it cost to buy and why is it this price?

Juicy Salif (Citrus Juicer)
Philippe Starck

How has the manufacturer made this product safe?

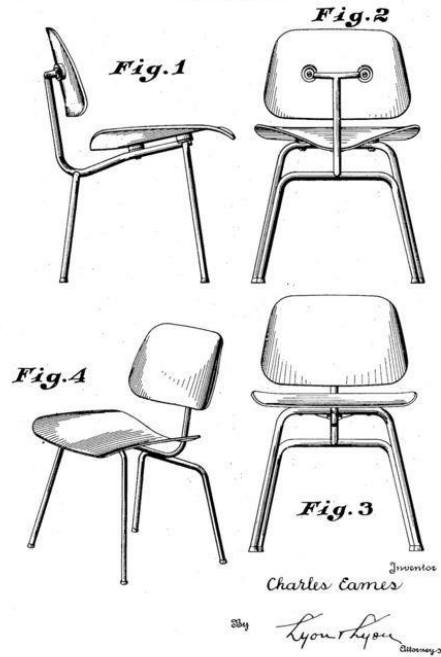
What do you think about the way this product looks?

Week 3: Drawing Techniques

Use the space provided to draw an accurate sketch using a ruler and pencil of a product you have at home. You should draw the front view, top view and side view similar to the example sketch of a chair shown below.

High quality drawings should be drawn with a ruler, colour shaded and the edges given emphasis using thick and thin line technique (See example below).

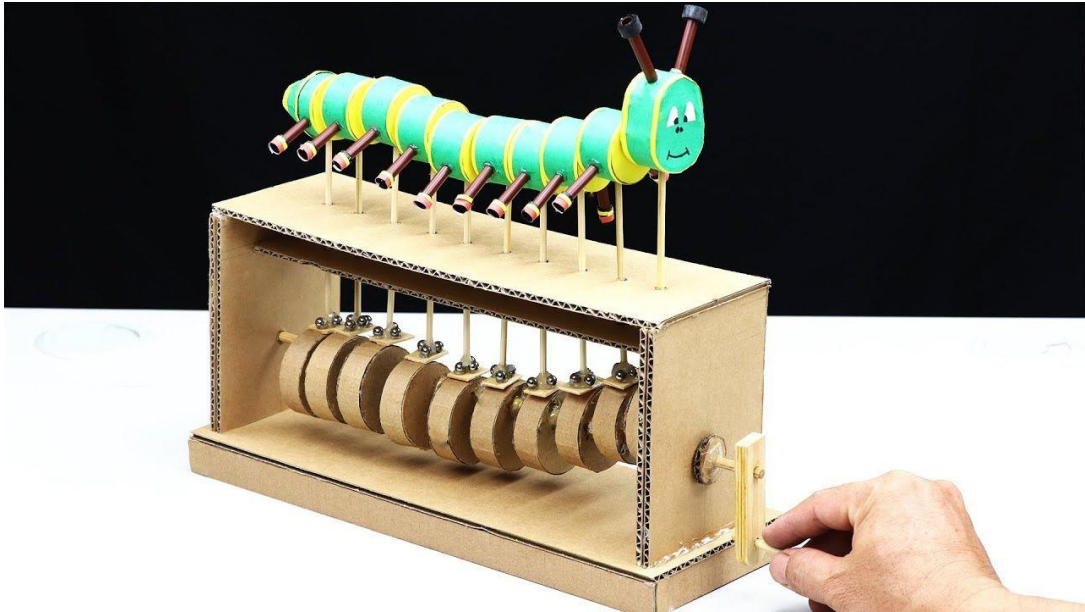
Aug. 24, 1948. C. EAMES Des. 150,685
CHAIR
Filed March 27, 1947



Week 4: Questionnaire

Write a questionnaire to find out what people like, don't like and would change or improve about this automata design.

You should collect results from as many people as possible but it must be more than one.



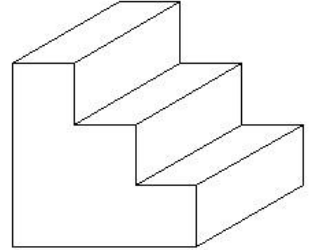
Questionnaire

No	Question	Response
1		
2		
3		
4		
5		

Week 5: Drawing Techniques

Use a ruler to accurately draw an item from your home using oblique drawing technique. You can choose any item you like; however, rounded items are more challenging to draw and require you to use the crating technique.

High quality drawings should be drawn with a ruler, colour shaded and the edges given emphasis using thick and thin line technique (See example below).



Week 6: Tool Identification

Use the word bank to identify the tools and label each image with the correct name.

Chisels, Steel Rule, Screw Drivers, Claw Hammer, Vice, Glass paper, Pillar drill, Coping saw, Bench hook, Wooden mallet, Disk sander, Tenon saw, Scroll saw, Try square.



Week 7: Practical Mathematics

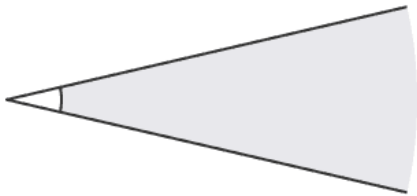
Complete the mathematics questions below. All of the questions are linked to a likely practical use within Design and Technology.

Q1. Measure this line accurately using millimetres (mm) as the units for your answer.



Length = mm

Q2. Measure and label these angles using degrees as the units.



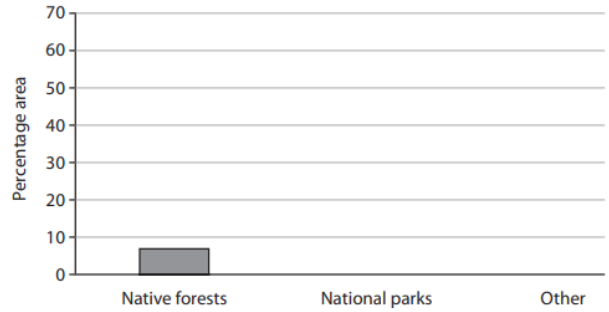
Q3. If I have a sheet of wood that is 600 x 400 mm in size. How many whole parts will I be able to get out of it if each part is 125 x 80 mm.

Whole parts

Q4. Analyse the information in Figure 8 about the sources of mahogany.

Complete the bar chart below to show the percentage grown in each area. The first one has been done for you.

Sources of mahogany	Percentage grown in each area (%)
Native forests	7
National parks	30
Other	63



Q5. There are 35 squares shaded in a 50 square grid. What percentage of the grid is shaded?

..... %

Q6. If a chair was drawn at a scale of 1:2. What size would the drawing be?

- Quarter
- Half
- Third
- Double

Q8. Write 3.5 inches as a fraction (Fractions are usually how inches are written).

Answer

Week 8: Risk Assessment

Complete the risk assessment for tasks you carry out in your every day life. These could be things like cooking, playing sports, traveling to school; however, it is best if there are some obvious dangers involved in the task.

What is a risk assessment?

A risk assessment is the process of identifying the hazards that are associated with a specific activity; considering how likely the hazard is to happen and how severe an injury could result from it; then taking steps to reduce the likelihood or severity of the hazards outcome.

In simple terms it is deciding what we need to do in order to make a task safer.

What is the point in a risk assessment?

Risk assessments are a way for us to regularly check that we are doing everything we can to keep people doing dangerous tasks safe. They also help companies to train new staff and us at school on how to use equipment safely. They may even be used in court as evidence if an injury occurred to prove that a company took reasonable measures to protect the user.

Who needs to do, see and understand risk assessments?

Risk assessments are done by us all the time; we constantly evaluate the risks around us and make decisions to ensure we are safer. In business you will find that companies with over 5 employees must by law formally log and review their risk assessments.

At school we use risk assessments for lots of things such as; sports activities, practical workshop tasks, school trips and many more things. If you go on to work in: catering/hospitality, manufacturing, construction, office work, supermarkets and many more careers; you will need to become familiar with these documents when you start.

Using a Risk Matrix

A risk matrix is a 5 by 5 grid that helps us to decide on the risk level for a specific task/activity.

We first score the likely hood from 1 to 5; then we score the severity of the injury from 1 to 5. Then we can match up the two columns to get the risk (likelihood x severity = risk). The risk value will be a number between 1 and 25 and can be colour coded to give us the over all risk.

Example Risk Assessment

I am cutting up an onion for dinner and may cut my finger with a knife. The likelihood is 3 because it is quite possible but not likely because I am skilled. The severity is 2 because although it might hurt it would usually only require a plaster and nothing more. Therefore the risk is 6 (moderate) on our risk matrix.

		Negligible 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
Likelihood	5 Almost certain	Moderate 5	High 10	Extreme 15	Extreme 20	Extreme 25
	4 Likely	Moderate 4	High 8	High 12	Extreme 16	Extreme 20
	3 Possible	Low 3	Moderate 6	High 9	High 12	Extreme 15
	2 Unlikely	Low 2	Moderate 4	Moderate 6	High 8	High 10
	1 Rare	Low 1	Low 2	Low 3	Moderate 4	Moderate 5

Risk Assessment

What is the task and what are the hazards?	Who might be harmed and how?	Severity	Likelihood	Risk	How can you reduce the risk?

Week 9: Life Cycle Analysis

Evaluate the impact this product has on the planet over its entire lifecycle and suggest ways in which it could be improved.

1. Raw Materials

What is this toy made of?

What is the surface covered with?

2. Manufacturing

How might this toy be made?

6. Disposal

How easy would this be to take apart?

Can the materials be; recycled, reused, biodegrade or given a new use?



3. Packaging

Describe how the packaging would protect this product.

5. Use

Does it consume energy? How?

4. Distribution

Where would this lamp be sold?