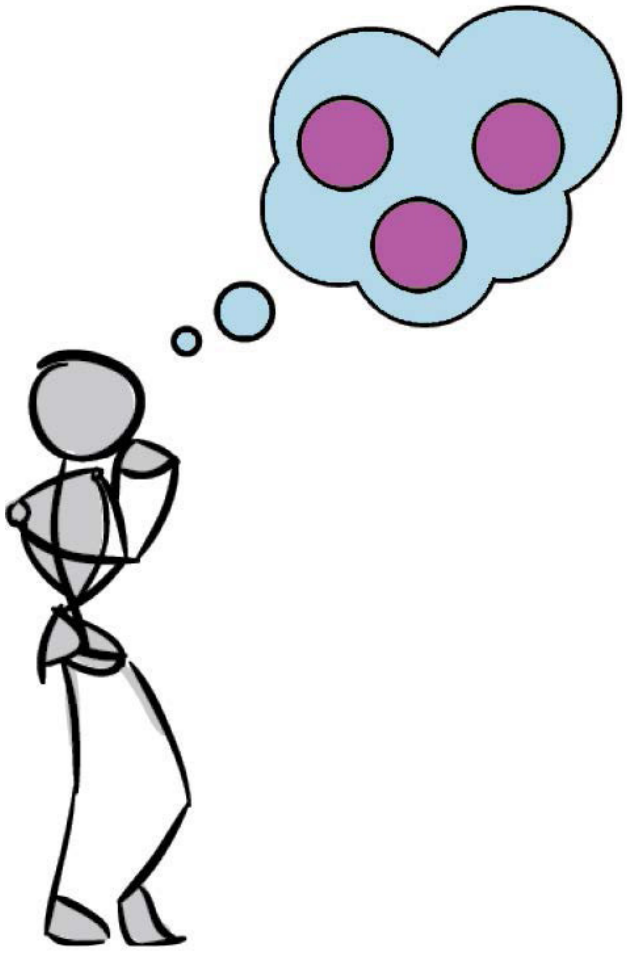
IDEAShub

TOOLS FOR CREATIVE IDEAS



Student Workbook

IDEASHub

TOOLS FOR CREATIVE IDEAS

Lesson 1

Lesson 1: Curious about Creativity

Overview

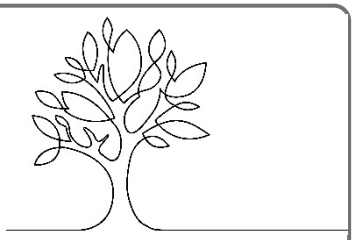
By the end of the lesson, pupils should be able to:

- Explain what creativity is.
- Explain why it is important to think creatively.
- Identify the differences between the left and right hemispheres of the brain.

Class Length: 40 minutes

Year Groups: All ages

Resources: Computer, projector, printed handouts, pencils.



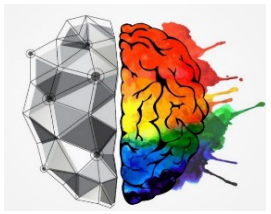
Lesson Structure

1. Why Promote Creativity?
   - Technological Advancements
   - Developing Problem Solvers
   - Financial Benefits

2. Creativity in Education
   - We all need to understand and value the unique position of creativity in education.
   - In order for society to progress, it is essential that there are creative thinkers in society.
   - This will be explained by using a short story of artificial light through history.

3. Defining Creative and Creativity
   - Creative involves the use of your imagination or original ideas to create something.
   - Creativity can be defined as something novel (new / original) and useful.

4. Left and Right Brain Modes
   - There are two distinct, but connected brain halves.
   - The two brain modes support our creative functions.



5. Developing Creative Abilities
   - Students should understand that it is possible to develop creative abilities and that we are all

Lesson Activities

Activity 1

Purpose: To help pupils identify everyday problems, and how to improve daily life.

Through small changes, through creative problem solving, one can solve everyday problems.

Activity 2

Purpose: To recap the lesson.

- What is creativity?
- The differences between the brain hemispheres.
- What are the main actions of a creative person?

Lesson Notes

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Lesson 1: Curious about Creativity

Activity 1: Everyday problems

To understand problem solving as a daily activity, we will explore the everyday life of a person. In this activity we will analyse an average day for a person, identifying simple problems they face. You must use your imagination to think of ways to overcome these simple problems helping them to have an easier life.

Person's Name: _____	Person's Age: _____	Profession: _____	Main hobby: _____
Describe a typical morning for this person:	Describe a typical afternoon for this person:	Describe a typical evening for this person:	Describe a typical night for this person:
From their morning activities, identify one a problem or issue the person faced?	From their afternoon activities, identify one a problem or issue the person faced?	From their evening activities, identify one a problem or issue the person faced?	From their night activities, identify one a problem or issue the person faced?
Use your imagination to solve this issue for this person	Use your imagination to solve this issue for this person	Use your imagination to solve this issue for this person	Use your imagination to solve this issue for this person

Lesson 1: Curious about Creativity

Activity 2 – Recap Activity

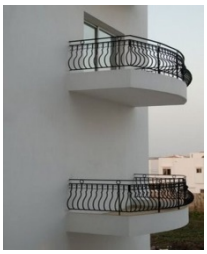
Q1. Explain in your own words the term 'creativity'?

Q2. List the actions of a creative person.

Q3. Identify a possible problem from each of the images below.

Problem: _____

_____



Problem: _____

_____

Problem: _____

_____

Problem: _____

_____

Q4. Explain the differences between the brain hemispheres?

Right:

Left:

Q5. Observe the following images. Identify what each image represents by activating your right hemisphere.

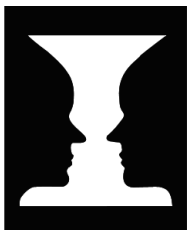


Image represents: _____

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Image represents: _____

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Image represents: _____

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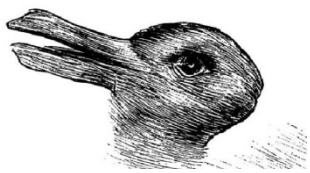

Image represents: _____

_____

Q6. What do you see in the image below?

Push your imagination further, and think laterally for different and random ideas on what this image could be!

In the image I see: _____

Different and random ideas on what the time could be:

a. _____

b. _____

c. _____

d. _____

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Lesson 2

Lesson 2: Design by People and Nature

Overview

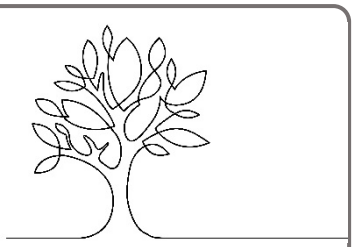
By the end of the lesson, pupils should be able to:

- Understand the role of designers/design
- Understand that creativity is an everyday skill
- Understand the role of nature in design

Class Length: 40 minutes

Year Groups: All ages

Resources: Computer, projector, printed handouts, pencils, ear buds.



Lesson Structure

1. Everyday problem solving
   - Where does problem solving exist in our daily lives?
   - Who is a problem solver?

2. The role of a designer
   - Challenges the way things are in the world
   - Finding problems
   - Solving problems

3. Biomimicry
   - Bio = Nature
   - Mimic = To replicate/copy
   - Biomimicry is copying nature to solve problems.

Lesson Activities

Activity 1

Purpose: Students will be asked to identify problems they encounter in their daily life. Outline how they overcame these problems. Outline their solutions to these problems.

This activity sheet also gets students to reflect on how objects we design damage the environment. Students will try think of solutions to overcome the negative impact of

Activity 2

Purpose: Students will practice biomimicry to design the following objects:

- Superhero
- Hobby Equipment
- Phone
- Car
- Something wild and whacky

Lesson Notes

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Lesson 2: Design by People and Nature

Activity 1

Q1: What is the role of a designer?

Q2: Identify 5 things you encounter on a daily basis that cause problems for you? (*These are things, not people; be respectful*)

Q3. List 5 challenges or obstacles that caused you to put your problem solving to action over the past 5 days?

Q4. Outline your solutions to 5 challenges you encountered over the past 5 days?

Q5. Can you think of an everyday product that is having a negative effect on our world?

Q6. Can you think of possible solutions to this everyday product having a negative effect on our world?

Lesson 2: Design by People and Nature

Activity 2: Biomimicry

Pick an animal or plant from nature that you like and study it.

Use the animal or plant as inspiration to design the following in points 1-5.

1. Create a Superhero by copying an animal/plant in nature.

2. Create equipment for your hobby by copying an animal/plant in nature.

3. Create a new phone by copying an animal/plant in nature.

4. Create a new car shape by copying an animal/plant in nature.

5. Create something wild and whacky by copying an animal/plant in nature.

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Lesson 3

Lesson 3: Puzzling Problems

Overview

By the end of the lesson, pupils should be able to:

- Understand what a problem is.
- Understand how to solve a problem.
- Use problem solving processes or methods.

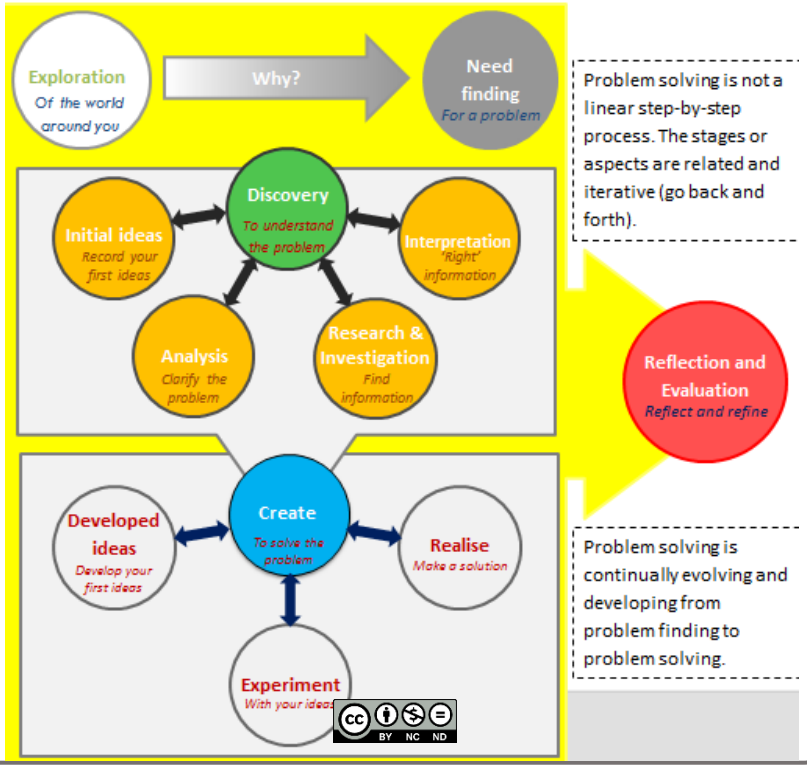
Class Length: 40 minutes

Year Groups: All ages

Resources: Computer, projector, printed handouts, pencils.

Lesson Structure

1. What is a problem?
   - Define what a problem is.
2. How to solve a problem.
   - Explore problem solving methods.
3. Multiple stages:
   - *Finding a problem (unless it is given to you)*
   - *Understanding the problem*
   - *Solving the problem*



Lesson Activities

Activity 1

To find a problem (or when given a problem) you must:

- Explore the world around you
- Find issues
- Find what is needed to make life better
- Define the problem
- Reflect and evaluate

Activity 2

To help you understand the problem:

- Capture your first ideas or thoughts
- Clarify the problem
- Find out information and key facts
- Select suitable information
- Reflect and evaluate

Activity 3

To create a solution to the problem:

- Develop ideas further
- Experiment and test your ideas
- Make a possible solution
- Reflect and Evaluate

Lesson Notes

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Lesson 3: Puzzling Problems

Activity 1 – Finding a problem

Problem Statement:

Find a problem to solve in the classroom.

OR

Design a seating device for your classroom.

To find a problem (or when given a problem) you must:

- Explore the world around you
- Find issues
- Find what is needed to make life better
- Define the problem

Create a mind-map with keywords summarising possible problems from your exploration of the world around you.

Create a list of all the issues:

Detail what is needed to make life better

Define the problem

Lesson 3: Puzzling Problems

Activity 2 – Discover to understand the problem

Write your Problem Statement:

To help you understand the problem:

- Capture your first ideas or thoughts
- Clarify the problem
- Find out information and key facts
- Select suitable information

REMEMBER TO CONTINUALLY Reflect and evaluate

Capture your first ideas or thoughts (use more paper if needed)

Clarify the problem by breaking it down into key words (use more paper if needed)

Record the information and key facts (use more paper if needed)

What is the important information you found out? (use more paper if needed)

Lesson 3: Puzzling Problems

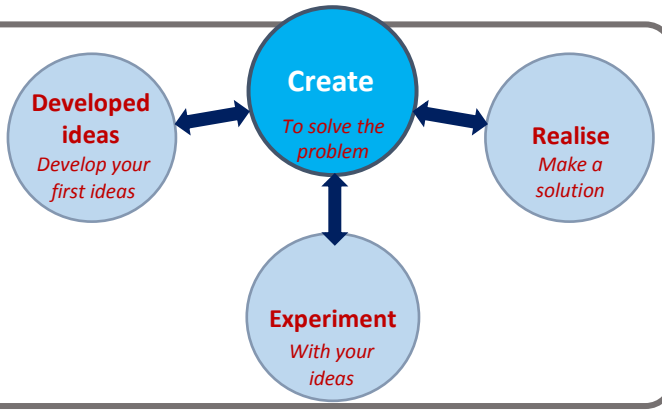
Activity 3 – Create to solve the problem

Write your Problem Statement:

To create a solution to the problem:

- Develop ideas further
- Experiment and test your ideas
- Make a possible solution

REMEMBER TO CONTINUALLY Reflect and evaluate



Develop your ideas further

Record your experiments and testing of your ideas (use more paper if needed).

Outline your plan to make a possible solution.

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TOOLS FOR CREATIVE IDEAS

Lesson 4

Lesson 4: Incredible Ideas

Overview

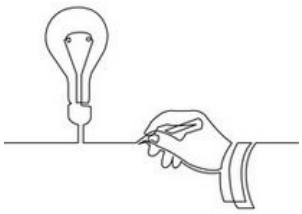
By the end of the lesson, pupils should be able to:

- Overcome challenges in idea generation
- Understand the importance of natural idea generation
- Show an awareness to fixation
- Understand how to develop multiple ideas.

Class Length: 40 minutes

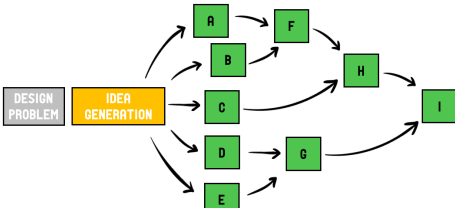
Year Groups: All ages

Resources: Computer, projector, printed handouts, pencils, ear buds.



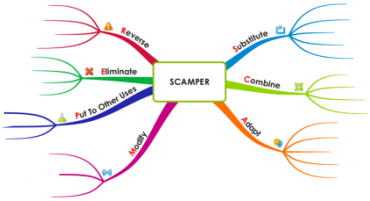
Lesson Structure

1. Challenges in Idea Generation
   - Many methods, but some too specific, or too broad?
   - Ideal situation in idea generation
   - The importance of generating multiple ideas.



2. Fixation
   - What is fixation?
   - Limiting nature of fixation
   - Ways to overcome fixation

3. Idea Generation
   - Break the problem into parts; analysis
   - Brainstorm ideas from your head; natural idea generation
   - Strive for more ideas using SCAMPER



Lesson Activities

Activity 1

To overcome fixation, and work toward generating multiple ideas, break the problem into parts.

Create a mind-map for each keyword in the problem statement.

Activity 2

It is important to capture the ideas you have in your head, before you look for inspiration elsewhere. Otherwise you may fixate on existing ideas, rather than your own ideas.

So using brainstorming, capture your natural ideas, from your head.

Activity 3

We all find it difficult to think of multiple ideas. SCAMPER will help students push their thinking further using simple prompts (SCAMPER).

Lesson Notes

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Lesson 4: Incredible Ideas

Activity 1 – Break the problem into parts - Mind-map analysis

LEGO wants you to design a new toy for children aged between 7 and 12 years of age.

The toy should be for use by both male and females and should be fun.

Consider key factors like materials, use and the appearance of the toy.

Shown below are the keywords from the problem statement above. Create a mind map for each of the keywords below. You have approximately 10 minutes.

LEGO toy

Toy use

Fun feature

Interests of child ages 7-12

Gender neutral

Appearance

Material

Lesson 4: Incredible Ideas

Activity 2 – Natural Idea Generation - Brainstorm

LEGO wants you to design a new toy for children aged between 7 and 12 years of age.

The toy should be for use by both male and females and should be fun.

Consider key factors like materials, use and the appearance of the toy.

Using the LEGO problem and the mind-map of keywords you created; Brainstorm ideas. In the space provided, sketch and write about ideas that pop into your head.

Lesson 4: Incredible Ideas

Activity 3 – SCAMPER

LEGO wants you to design a new toy for children aged between 7 and 12 years of age.

The toy should be for use by both male and females and should be fun.

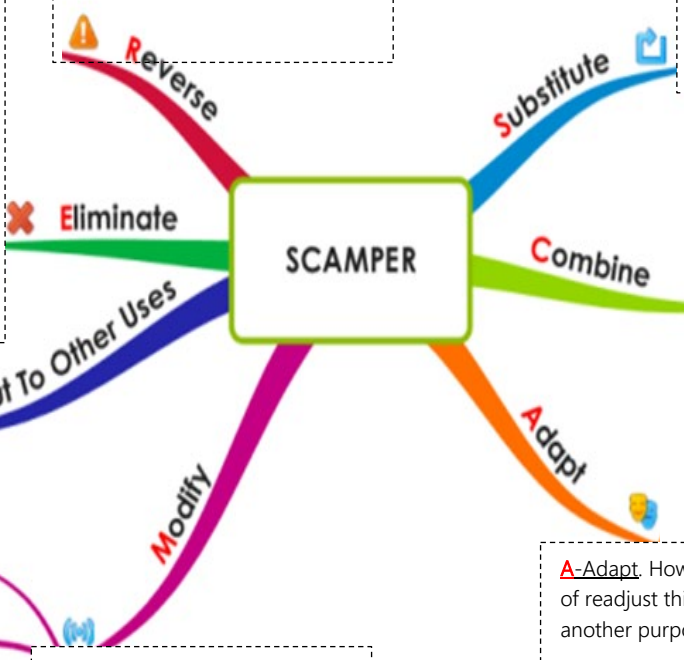
Consider key factors like materials, use and the appearance of the toy.

Using the LEGO problem, generate ideas using SCAMPER in the spaces provided.

R – Reverse or Rearrange. How can I change, reorder or reverse the product?

S – Substitute. What could you substitute or swap to improve the product?

E – Eliminate. How can you simplify this product?



C – Combine. What would happen if you combined this product with another, to create something?

P – Put to other use: Can you use this product somewhere else, or for some other use? Who else could use it?

A-Adapt. How could you adapt of readjust this product to serve another purpose or use?

M-Modify. How could you change the look, shape, or feel of your product? Could you add/subtract something?

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TOOLS FOR CREATIVE IDEAS

Lesson 5

Lesson 5: Idea Initiation

Overview

By the end of the lesson, pupils should be able to:

- Understand the purpose of the Design Heuristic tool.
- Understand how to use Design Heuristics to generate initial ideas.

Class Length: 40 minutes

Year Groups: All ages

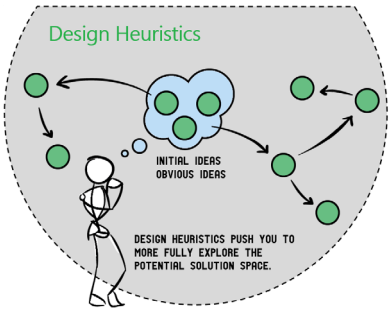
Resources: Computer, projector, printed handouts, pencils.

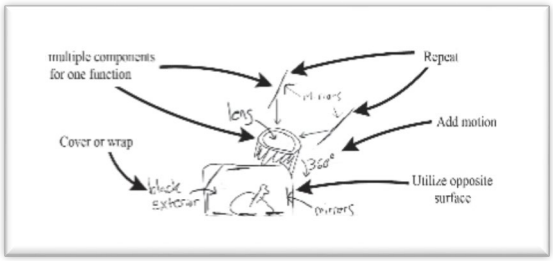
Lesson Structure

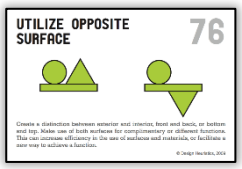
1. Introduction to Design Heuristics
   - What are Design Heuristics?
   - Idea modifiers to push your thinking further.
   - Design Heuristics are a tool to help you think and modify ideas.

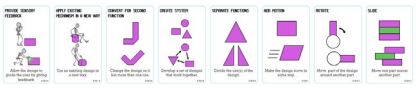
2. Design Heuristic Guidelines
   - Use any part of the tool to generate a new idea
   - Generate new ideas by applying a card to a previous idea
   - Use the abstract image to inspire ideas
   - Use the title to inspire ideas
   - Use the description to inspire ideas

3. Using the Design Heuristics
   - There are many ways to use Design Heuristics to push your idea generation and development further:
     - *Generate initial ideas*
     - *Transform ideas*
     - *Change parts or sub-components of ideas*









Lesson Activities

Activity 1

Purpose: Reinforces the importance of recording your own initial ideas first; natural idea generation.

Problem: Generate ideas for a superhero.

Activity 2

Purpose: To help students overcome exhaustion, they will use Design Heuristics to push their thinking a little further to generate more ideas.

Problem: Generate more ideas for a superhero.

Lesson Notes

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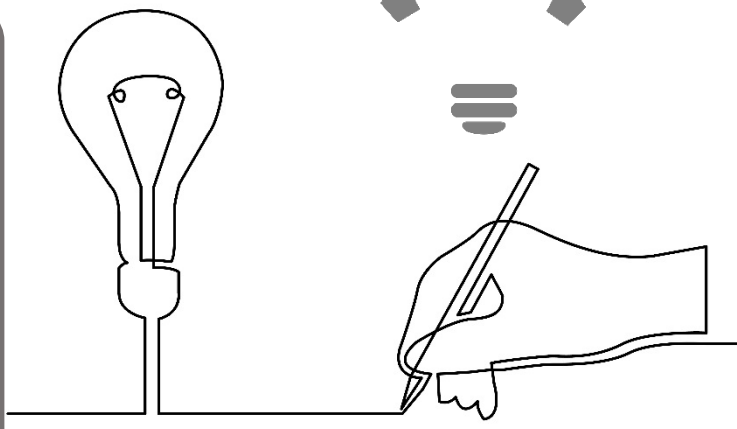
Lesson 5: Idea Initiation

Activity 1 – Natural Idea Initiation

Spend 20 minutes generating ideas for the following design problem:

Design a new Super Hero

Marvel comics have hired you to design their next big super hero for its next generation of movies. Amongst other things, you must pay particular attention to the superhero's super power and outfit.



Record your initial ideas in the space provided.

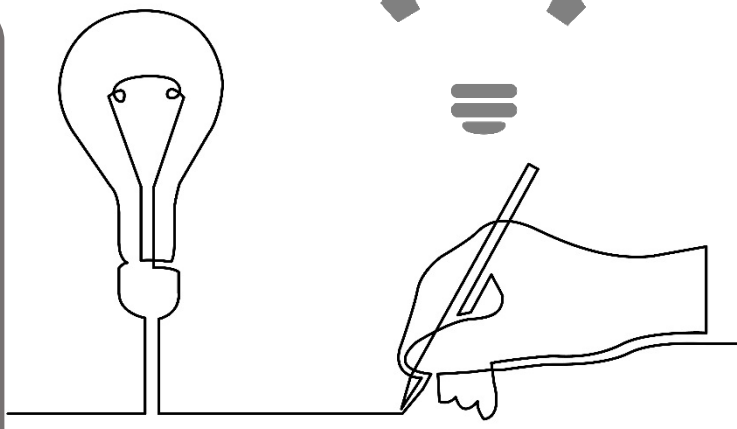
Lesson 5: Idea Initiation

Activity 2 – Idea Initiation using Design Heuristics

Spend 20 minutes generating ideas for the following design problem:

Design a new Super Hero

Marvel comics have hired you to design their next big super hero for its next generation of movies. Amongst other things, you must pay particular attention to the superhero's super power and outfit.



Using Design Heuristics, generate more initial ideas. Record ideas in the space provided.

Did you record your own natural ideas first? _____

Did the DH tools help you generate more initial ideas? _____

Did the tool help you generate an idea you didn't think of previously?_____

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TOOLS FOR CREATIVE IDEAS

Lesson 6

Lesson 6: Idea Transformation

Overview

By the end of the lesson, pupils should be able to:

- Understand how the Design Heuristic tool can be used to transform ideas.
- Use the Design Heuristic tool to transform ideas.

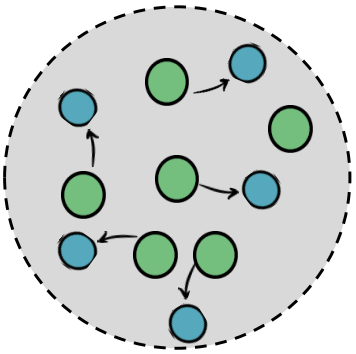
Class Length: 40 minutes

Year Groups: All ages

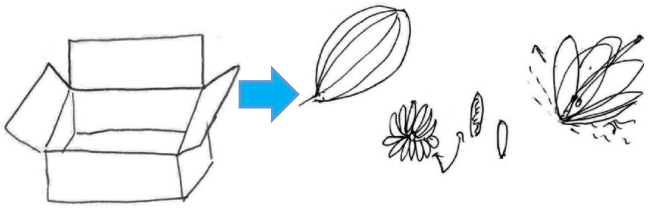
Resources: Computer, projector, printed handouts, pencils.

Lesson Structure

1. Introduction to Idea Transformation
   - Pushing ideas further using the Design Heuristic tool.
   - Understand the importance of developing multiple possible solutions.



2. Using Design Heuristics transform ideas
   - Design Heuristics can be used to modify / alter existing solutions.
   - Supports the development of initial ideas and existing products.
   - Supports overcoming fixation.



Lesson Activities

Activity 1

Transforming a Superhero (Lesson 5)

Purpose: To transform initial ideas generated in the Superhero activity.

Students will push these initial ideas further by transforming the ideas using Design Heuristics.

Activity 2

Transform an existing product.

Purpose: To transform modify an existing product using the Design Heuristic tool.

.

Activity 3

Transforming ideas in teams.

Purpose: To promote collaboration during a transformation design activity.

Students work together modifying their transformed ideas towards a final transformed idea.

A reflection on the transformation

Lesson Notes

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Lesson 6: Idea Transformation

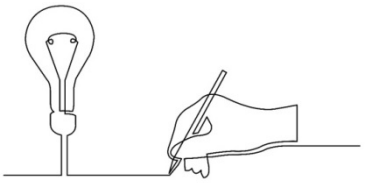
Activity 1

Spend 15 minutes transforming your initial ideas from Lesson 5 activity using Design Heuristics:

Design a new Super Hero

Marvel comics have hired you to design their next big super hero for its next generation of movies. Amongst other things, you must pay particular attention to the superhero's super power and outfit.

Using your generated initial ideas from Lesson 5, push these initial ideas



Did the design heuristics help you transform your initial ideas? _____

Describe how the design heuristics helped you transform your ideas? _____

Lesson 6: Idea Transformation

Activity 2

Spend 15 minutes developing ideas for a new back-pack for a specific user.

Using the Design Heuristics tool (one, or more) transform / modify one of the existing products shown below.




Did the design heuristics help you transform the existing products? _____

Describe how the design heuristics helped you develop new ideas by transforming existing products?

_____

_____

Lesson 6: Idea Transformation

Activity 3: Teaming

a) Spend 5 minutes developing ideas for a new water bottle.

Using the Design Heuristics tool (one, or more) transform / modify a water bottle.

Short explanation of each idea(s):

_____
_____
_____
_____

INSTRUCTIONS

1. In space (a) using the card given to you, modify a water bottle. (5 minutes)
2. Pass this sheet to a classmate. Your classmate will modify your idea or a water bottle using a new Design Heuristic in space (b). (5 minutes)
3. Pass this sheet to another classmate. Your classmate will modify your idea or a water bottle using a new Design Heuristic in space (c). (5 minutes)
4. Work together to discuss the ideas and develop a final design.

b) Classmate 1 Ideas representing further modifications

Short explanation of idea(s):

_____
_____
_____

c) Classmate 2 Ideas representing further modifications

Short explanation of idea(s):

_____
_____
_____

Lesson 6: Idea Transformation

Activity 3: Teaming

d) Final transformed design idea.

Consider all the water bottle modifications. Work together to discuss all ideas. Develop a final transformed design.

REFLECT: Describe how all your ideas transformed toward your final team design idea.

_____

_____

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IDEASHub

TOOLS FOR CREATIVE IDEAS

Lesson 7

Lesson 7: Subcomponent Design

Overview

By the end of the lesson, pupils should be able to:

- Understand subcomponent design.
- Understand decomposition and recomposition.
- Use the Design Heuristic tool to design parts of ideas or products.

Class Length: 40 minutes

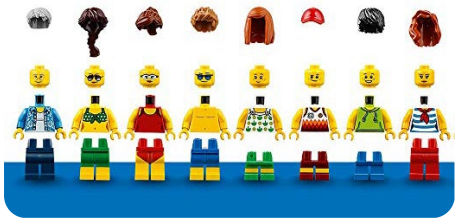
Year Groups: All ages

Resources: Computer, projector, printed handouts, pencils.

Lesson Structure

1. Introduction to Subcomponent Design
- Design Heuristics can be used to modify individual components or parts of existing products or ideas.
- This enables designers to improve individual parts of a design.

2. Subcomponent Design
- Design by parts or components is a method which comes from engineering.
- Involves two activities:
    a. Decomposition: breaking something into smaller parts.



Lesson Activities

Activity 1
Purpose: Subcomponent Design Familiarisation

Subcomponent Design – Bicycle: The students will be asked to select 5 subcomponents of a bicycle and redesign each individual subcomponent.

Activity 2
Purpose: Decomposition

This activity will enable to understand the concept decomposition by redesigning the subcomponents of a seating device.

Activity
Purpose: Recomposition

This activity will enable to understand the concept recomposition by redesigning decomposed subcomponents of the seating device from activity 2.

Activity 4
Subcomponent Design – Superhero:

This activity will see the students redesign prescribed and optional subcomponents of their superhero.

Lesson Notes

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Lesson 7: Subcomponent Design

Activity 1 - Decomposition

Break down a classroom product and list 3 subcomponents you would like to redesign.





Classroom product name
(*If possible include an image or sketch of this product*):

Decomposed product part 1:

Decomposed product part 2:

Decomposed product part 3:

Lesson 7: Subcomponent Design

Activity 2 - Decomposition

Spend 10 minutes generating ideas to redesign the decomposed subcomponents of a seating device. Use Design Heuristics to support your idea generation. Sketch and write notes on your ideas.

Idea generation for decomposed product part 1:

Idea generation for decomposed product part 2:

Idea generation for decomposed product part 3:

Lesson 7: Subcomponent Design

Activity 3 - Recomposition

Spend 10 minutes combining your generated ideas from the decomposed subcomponents of a classroom seating device. Use Design Heuristics if further support is needed to support your idea generation.

Decomposed product idea generation 1:	Decomposed product idea generation 2:	Decomposed product idea generation 3:

Recombined ideas to create a new idea

Lesson 7: Subcomponent Design

Activity 4 – Superhero redesign

Design a superhero using subcomponent design. Using the Design Heuristics, design the decomposed individual components of your favourite superhero. Then use Recomposition to generate numerous superheros.

Subcomponent: Outfit

Subcomponent: Superpower

Subcomponent: Footwear

Subcomponent: _____

Recomposition: Using the decomposed ideas for the various parts of a superhero, recombine various parts to generate numerous superheros.

Has your superhero changed since Lesson 5? _____

If so, explain how: _____

How did the Design Heuristics support you? _____

_____

IDEASHub

TOOLS FOR CREATIVE IDEAS

Lesson 8

Lesson 8: More Tools for Creative Ideas

Overview

By the end of the lesson, pupils should be able to:

- Understand the various tools to support idea generation.
- Use the various tools to support idea generation.

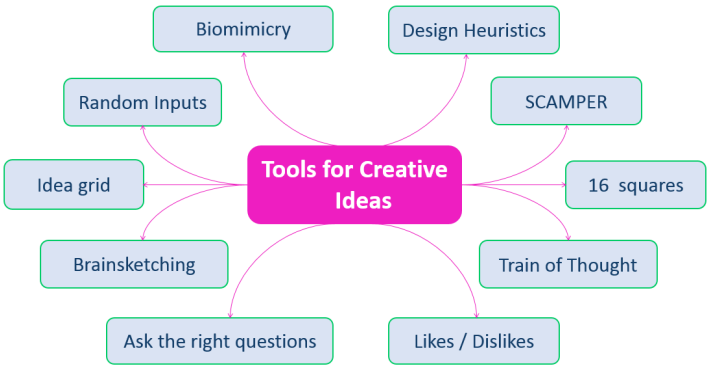
Class Length: 40 minutes

Year Groups: All ages

Resources: Computer, projector, printed handouts, pencils.

Lesson Structure

- To explore a variety of tools to support and assist creative idea generation and development.
- To capture our initial ideas, and diverge (push our ideas further) our thinking with the various tools.
- To reflect on our problem and make choices, converging toward the best idea.



Lesson Activities

Activity 1. 16 Squares: Students must attempt to think of 16 possible ideas for a problem task. The goal is to strive for quantity; to generate as many ideas as possible, and not to fixate.

Activity 2. Considering all factors – Train of Thought: Students must ensure they have thought of every possible idea to solve the problem by using each letter of the alphabet.

Activity 3. Likes / Dislikes: Students must think of all the things they like about something, and added to improve something else. Equally students must think of things they dislike, and how they could be removed to improve or make something better.

Activity 4. Ask the right questions: The students must answer key questions using the 5W + H prompts to generate ideas to solve the problem.

Activity 5. Brain-sketching: in a team/group, students all sketch a generated idea in one quarter of the handout. Then students will rotate their idea sheet to another member of their team/group. Students generate an idea by piggy-backing off their team members' idea.

Activity 6. Idea Grid: Morphological analysis: By identifying the key requirements of the problem, and variations of the requirements, a range of ideas can be morphed. The requirements' variations allow the student to transform their ideas easily.

Activity 7. Random Inputs: By incorporating a random input into their idea, or joining random inputs together to generate

Lesson Notes

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Lesson 8: More tools for Creative Ideas

Activity 1: 16 Squares

Lesson 8: More tools for creative ideas

Activity 2: Considering all Facts – Train of Thought

Use each letter of the alphabet to generate ideas to solve the problem

A	B	C	D	E	F	G
H	I	J	K	L	M	N
O	P	Q	R	S	T	U
V	W	X	Y	Z	Least Favourite Idea	Favourite Idea

Lesson 8: More tools for creative ideas

Activity 3: Likes / Dislikes

Identify 10 things you like. Can these 'likes' be added to improve something? Generate 20 ideas by adding what you like to something existing.
Identify 10 things you like. Can these 'dislikes' be removed to improve something? Generate 20 ideas by removing what you dislike from something existing.

Likes				
Generate ideas by adding what you like to something existing.				

Dislikes				
Generate ideas by removing what you dislike from something existing.				

Lesson 8: More tools for creative ideas

Activity 4: Ask the right questions

5W + H questions	Generate ideas to address the 5W + H questions to ensure you have addressed all aspects in solving the problem
Who will use it?	
What will it be used for?	
Where will it be used?	
When will it be used?	
Why will it be used?	
How will it be used?	

Lesson 8: More tools for creative ideas

Activity 5: Brain-sketching

Problem to be Solved:	
Student 1: _____ IDEA 1	Student 2: _____ IDEA 2
Student 3: _____ IDEA 3	Student 4: _____ IDEA 4

Lesson 8: More tools for creative ideas

Activity 6: Idea Grid

Problem						
Requirements						
Variations	1.					
	2.					
	3.					
	4.					
	5.					
	6.					

Lesson 8: More tools for creative ideas

Activity 7: Random Inputs

Use the random inputs to generate ideas. You can join these together, or to an existing idea.

Random Input 1	Random Input 2	Random Input 3	Random Input 4
IDEA 1		IDEA 2	
IDEA 3		IDEA 3	