Activity title

Designing a Hoverboard

Time required

1 hour

Activity summary

Designing a hoverboard

By the end of this activity, you will be able to:

- Design a levitating hoverboard that would work.
- Communicate design ideas using sketches, notes and annotations.

What equipment will you need?

Sketching equipment, pencil, coloured pencils, eraser.

How to do it

Imagine what life would be like if we could make things levitate – just float in the air. Scientists have developed ways to let us do this. In this activity you will design a levitating hoverboard that is aimed at teenagers.

There are many ways that we could make things levitate. One of the best techniques is to use magnetism, like a maglev train. However, this could also be achieved using air pressure, like a hovercraft, or even using jets or rocket power, like a harrier jump jet.

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Now try this

1. Read the Situation and Design Brief for this activity.

Situation

1980s films predicted that by 2015 people using hoverboards would be a very common sight! Only now is the technology finally reaching the point where they can become a reality.

Brief

Design a hoverboard for use by teenagers, that can move forwards without making contact with the ground. Your product should use a suitable method of keeping the board in the air.

Criteria:

The product must:

- Be suitable for use by teenagers.
- Be able to move forwards whilst a person is standing on it, without touching the ground.
- Use a suitable method to achieve levitation.
- Be aesthetically appealing to the target audience.

Story behind the design: Watch the movie clip about hoverboards from Back to the Future Part 2:
https://www.youtube.com/watch?v=TkyLnWm1iCs

2. On the next page sketch your idea for a product. It must satisfy the needs of both the brief and the given design criteria. Make sure that you show and fully explain how the hoverboard achieves levitation using an appropriate method.

Magnetic Hoverboard Design

Use this space to sketch your idea for your product.
Do not forget to annotate your design to show how it meets the design criteria!

Notes about design:

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You could also

Think about the other potential uses of products that can levitate. In the table below, write down ideas for three different ways that this technology could be used, giving some advantages for each.

An example has been completed for you.

Idea	Advantage
Example *Moving people around a hospital (replacing trolleys)*	*Smooth movement with no bumps, reduces the effort needed by the hospital staff*
1	
2	
3	

The following websites can be used for additional background information:

- **YouTube – Lexus Hoverboard story:** the story behind the design of the Lexus hoverboard. https://www.youtube.com/watch?v=q_BYvUlDviM
- **YouTube – Lexus Hoverboard science:** the science behind the design of the Lexus hoverboard. https://www.youtube.com/watch?v=IM0sRctOxQc
- **Wired – How hoverboards work:** Explanation of how the most promising hoverboard designs function. https://www.wired.com/2015/10/how-the-most-promising-hoverboards-actually-work/
- **GCSE Bitesize – Electromagnetism and magnetism:** Revision notes explaining the theory behind electromagnetism and magnetism. https://www.bbc.co.uk/education/guides/z3g8d2p/revision/1

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What results were expected?