

Smart clothes

Secondary: (ages 11 – 14)

Interdisciplinary (visual arts and technology)



Students are challenged to design an item of ‘smart’ clothing: clothes that are not simply wearable but have a double function and incorporate technology to help or support people in various ways. For example, “wearables”: clothes that are composed of intelligent material that is washable, and that contains micro sensors that measure the heartbeat, location and speed of the wearer. This project is about combining various applications into a new design.

Time allocation 5 lesson periods

Subject content Produce creative work, explore ideas, and record experiences
Identify a technological/design solution to a problem
Present, analyse, and evaluate artistic work

Creative and critical thinking This unit has a **creativity** focus:

- Make connections to knowledge from other disciplines
- Generate and play with unusual ideas to create a meaningful output
- Reflect on the novelty of the solution and its possible consequences

Other skills Problem-solving

Key words design; wearables; smart clothes; fashion; innovation

Products and processes to assess

This activity encourages students to be imaginative as they design a piece of smart clothing. At the highest levels of achievement, their product seamlessly combines two or more interesting functions and therefore takes appropriate risks in its formulation and composition. During their work process, they consider several ways of approaching the problem, are open to exploring a wide variety of ideas, show a good awareness of the risks they have taken, are able to justify why they have made the choices they have made, and reflect on the process to articulate both the potential benefits and drawbacks of their design.

Teaching and Learning plan

This plan suggests potential steps for implementing the activity. Teachers can introduce as many modifications as they see fit to adapt the activity to their teaching context.

Step	Duration	Teacher and student roles	Subject content	Creativity and critical thinking
1	Lesson period 1	<p>Introduction and explanation of the unit. Clothing has always been used to cover people, to protect (against cold and wind), or to decorate (fashion). But now there is a revolution in the clothing world. Clothes are not only meant to be beautiful or simply functional, but also <i>smart</i>. There is a steady increase in the design of 'wearables': clothes made from materials that react to our body signals, senses, temperature or emotions.</p> <p>First brainstorm: What can you do with a dress, apart from the traditional uses of covering and protecting your body? Come up with as many applications as possible in a few minutes. Which ideas are the most original? Point out the 4 best ideas</p>	Making connections between technology, design, and fashion	Generating and playing with unusual ideas about the design and function of clothes
2		Teacher provides background for the theme. Use the PowerPoint (up to slide 14) to explain the theme of fashion. Students are assigned the task of creating as many possible different, original drawings, after seeing the PowerPoint and film clips. Students then get to work on their own ideas.	Developing drawing and sketching competency	
3	Lesson period 2	In lesson period 2, students go and research for themselves. Smart clothes originate from a cross-fertilization between fashion and design (fashion designers), technological developments and production (companies). Explore and think up as many possible ways in which clothes can help and support people. Search for images within the theme of clothing, fashion and various situations whereby we need clothing. Focus on <i>combining</i> ideas/applications within clothing items.	Researching fashion and design to find and combine relevant and interesting examples	Making unusual connections between different functions of clothes, between art and technology, and between different ideas
4	Lesson period 3	Teacher introduces theory to the activity with regard to visual aspects (power-point from slide 15). Give explanation on structures, colours and how to integrate these into clothing.	Developing knowledge of fashion design principles	
5	Lesson period 3 and lesson period 4	<p>Design a smart clothes item! Choose your best two ideas from the previous work, and develop them on sketch paper. Boundary conditions: take note of feasibility, wearability, and safety. Give a good explanation on what the <i>smart</i> part of your clothing item is.</p> <p>Reflection question: are there also disadvantages that you can think of about your smart clothes item?</p>	Developing proficiency in drawing and design techniques	Producing a meaningful output that feels new and interesting in relation to what the student has been exposed to
6	Lesson period 5	Develop one of your sketches further into a final work. Consider the context of the clothes item: for whom have you designed the clothing item? Where will the person wear it? Take the development of form and visual aspects into account during designing. Present your work to the class. Teacher leads a discussion about the designs. What stood out and why? What was really interesting and different? What did you learn from completing this activity?	Producing an interesting and appropriate final design	Appraising and improving work in progress, reflecting on the novelty of the final product

Resources and examples for inspiration

Web and print

- PowerPoint presentation (see appendix)
- Further examples of smart clothes can be found here: <https://www.wearable.com/smart-clothing/best-smart-clothing>

Other

- Pen, paper, markers
- Computer, tablet, or telephone (for research).

Creativity and critical thinking rubric

- Mapping of the different steps of the lesson plan against the OECD rubric to identify the creative and/or critical thinking skills the different parts of the lesson aim to develop

	CREATIVITY Coming up with new ideas and solutions	Steps	CRITICAL THINKING Questioning and evaluating ideas and solutions	Steps
INQUIRING	Make connections to other concepts and knowledge from the same or from other disciplines	1-3	Identify and question assumptions and generally accepted ideas or practices	
IMAGINING	Generate and play with unusual and radical ideas	1-6	Consider several perspectives on a problem based on different assumptions	3-4
DOING	Produce, perform or envision a meaningful output that is personally novel	5-6	Explain both strengths and limitations of a product, a solution or a theory justified on logical, ethical or aesthetic criteria	
REFLECTING	Reflect on the novelty of solution and of its possible consequences	5-6	Reflect on the chosen solution/position relative to possible alternatives	

Appendix

See PowerPoint saved as a separate document [here](#).