

## STEAM Ed – A scheme of work designed by B.Ed. students

(designed for a teaching and learning experience for sixth class (12year olds) in an elementary school in Ireland)

Theme	Design a wearable device/ helmet/ mask to simulate bee vision. (Note: The example given involves bees, but the overall approach can be adapted to cover a whole range of insects e.g. jumping spiders, flies and butterflies.)
	<ul> <li>STEAM Concepts: Light (sources, reflection and refraction, dispersion) Colour, Wavelengths of light, optics, design &amp; engineering challenges (creating prototypes).</li> <li>Understanding: Understanding of how humans vision vs animals' vision, awareness around vision and perception, creation of 2d/3d shape and form. Characteristics of Materials,</li> </ul>
STEAM	<b>Skills Development:</b> Independent research, drawing for design, design & Engineering, construction of form, manipulation of materials.

	Engage	
The Trigger	Wondering	Stretching and Exploring
Exploring animal/insect vision Explore human vision Developing empathy of	What are the main factors that effect human and animal vision? Dose the physically environment have an impact on how we	Asking Questions & Defining Problems. Children identify and research a specific animal or insect vision (e.g. Jumping spider, elephant, bee). Making Observations Documentation and
why animals / insects behave and live in the world.	experience vision? Research and identify specific animals' vision that you would like to investigate further	developing observational skills: sketching and drawing details from research (e.g. habitat, Ultraviolet light (UV), detailed drawings of animals.)
Better understanding of visions explore: Why humans and bee vision are different?	How can humans experience animal vision? The appreciation and wonder stage should be supported by looking to artists, scientist, and designers.	Planning & Carrying Out Investigations based on observations (e.g. colour wavelengths, UV light)



Inquiring & Doing					
Asking & Imagining	Envisage & Plan	Create Engage & Persist	Test & Share Express		
Engage with investigations: Make bi-coloured glasses and experience what bees see. Use a combination of coloured lenses altering the children's perception of the world. Test out UV paint on different materials and view using a UV light. Exploring the effects of UV Construct a simple pseudo scope using basic materials. A pseudo scope using basic materials. A pseudo scope reverses the information coming to each eye, and in so doing reverses our perception of space and distance. The pseudo scope concept begins to give children an idea of the difference between human and insect visions. Investigating light, explore how objects may be magnified using a simple lens	Optimizing the Design Solution Discussion around ideas, children are encouraged to make associations and connections by integrating their research and the concepts explored during the workshops. Drawing for Design. Sketch and design a wearable device/ helmet/ mask to simulate your research animal/ insect vision? Unit of the experiment of consider form and function. Refer to the experiences of the workshop based on the pseudo scope, lenses, mirrors and ultraviolet light. Negotiate: The class brainstorm and collectively decide on the best ideas to realise the bee vision experience. Children are encouraged to collaborate and co-operate throughout the entire process Present	Presentation: plan and write up a design brief with a list of the design criteria. Technical – consider all the practical elements of the design. Learning areas: design; construction; lengths, surfaces, and measurements; craft. Material manipulation and exploration. Explore the form and optics of device. Experiment with a variety of construction materials (recycled card, plastics and optics (mirrors and lenses) Will a statistical device. Superiment with a variety of construction materials (recycled card, plastics and optics (mirrors and lenses) Organise different elements of the design and construction the designed prototype. Trial - Experiment with ways to achieve all the different elements.	<ul> <li>Playful and Experiment.</li> <li>Show do not tell – Invite other classes to interact with your animal vision.</li> <li>Ask the user(s) to talk through their experience- what are they thinking? How do they feel?</li> <li>Share your vision and explain the process.</li> <li>Document your reflections in reflective journals</li> </ul>		

and mirrors

and discuss their research,



understanding and ideas around bee vision. The class writes a design brief to set out their intentions.





Improve & Re-test Applying Learning & Making Reflecting: Thoughtful Actions		Take The Next Step	
Connections (future designs)	Improve & Re-test	Applying Learning & Making Connections	Reflecting: Thoughtful Actions (future designs)
Reflect on the users experience and redesign to improve the users experience and understanding of human and animal vision. The teaching and learning experience will Consider extending the STEAM (concept to sound and movement exploration.) Research, critical thinking skills through experiential and practical learning in and through Geography, Visual Art, Maths and Scientific explorations. The integrative nature of this project develops children's creative and imaginative potential in Visual Art, STEM.	Reflect on the users experience and redesign to improve the users experience and understanding of human and animal vision.	The teaching and learning experience will include: Research, critical thinking skills through experiential and practical learning in and through Geography, Visual Art, Maths and Scientific explorations. The integrative nature of this project develops children's creative and imaginative potential in Visual Art, STEM.	Consider extending the STEAM concept to sound and movement exploration.