Learning activities summary: (Click on individual section headings for detailed descriptions of activities)

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| **Suggested time** | **Teacher activity descriptor** | **Teacher Resource build** | **Student activity descriptor** | **Student Resource build / artefacts required** | **Assessment (formative / summative)** |
| [Introduction to Bionic Eye Unit](#gjdgxs) | | | | | |
| 5-10 min | Teacher introduces unit by asking questions (on Power Point presentation) which push students to consider different aspects of vision from both a typical and vision impaired perspective.  Teacher gives a brief overview of vision impairment. | Classroom Resources: **Bionic Eye\_Introduction\_Presentation.pptx** | Students listen and participate in class discussion. |  |  |
| [Students brainstorm visual impairment](#30j0zll) | | | | | |
| 15 min | Teacher makes clear rules and objectives of brainstorming.  Teacher asks students to work in groups to brainstorm what they know about visual impairment and the challenges faced by visually impaired people. | See **Teacher notes: Brainstorming**  For ideas to stimulate discussion on challenges see [**Teacher notes:**](#3znysh7) **Challenges\_Visual\_Impairment**  Question prompts to stimulate student brainstorms on PowerPoint **slide 2**. | Working in groups, students brainstorm to consider the challenges that face visually impaired citizens. | Whiteboard/butchers paper or online program. | This task will enable teachers to assess prior knowledge of the topic.  Formative assessment of the students’ abilities to work in teams and brainstorm ideas can be made by listening to the group discussions and asking questions during this time. |
| [Class discussion of visual impairment and challenges faced by visually impaired people](#2et92p0) | | | | | |
| 20 min | Teacher asks each group to outline the key points they have discussed.  Teacher writes ideas on the white board and groups related ideas together. | Teacher notes with suggested methods to encourage every student to participate in the class discussion. See **Teacher notes - Enhancing student participation** | Student groups share their ideas with the class and participate in class discussion, helping teacher to group related ideas. |  | Formative assessment can be made of individual student’s verbal communication skills. |
| [Flipped Classroom – Vision impairment goggle creation and How to create box and whisker plots.](#3dy6vkm) | | | | | |
| 10-12 min | Teacher distributes vision impairment goggles template and instructions for creation of vision impairment goggles.  Teacher explains that the vision impairment goggles must be constructed, and that the **How to create box and whisker plots** video should be watched for homework. | For printable template and instructions to make visual impairment goggles: see **Materials for Challenges.docx**  See **Teacher notes: Flipped Classroom** | Students split into pairs and allocate jobs for creating vision impairment goggles. There are two types of goggles and one student per pair should create one type of visual impairment goggles.  Students create goggles for homework.  Students watch instructional video for homework: **How to create box and whisker plots.mp4** | Within the **Materials for challenges.docx** there are the following sections:  **Protocol for Making Vision Impairment Goggles**  **Template – Vision Impairment Goggles**  Homework: How to create Box + Whisker plots |  |
| [Introduction to visual impairment experience challenges](#4d34og8) | | | | | |
| 15 min | Teacher provides groups with cards describing Macular Degeneration and Retinitis Pigmentosa. Asks students to produce visual impairment goggles ‘A’ & ‘B’ (created for homework) and assign which goggles are representative of which disease.  Teacher introduces students to the various challenges to be performed (see details of challenges [**in Teacher notes - Visual impairment experience challenges**)](#2s8eyo1).  Teacher asks students in groups to predict the difficulties of the challenges with both types of visual impairment. | [**Teacher notes: summary of the causes and symptoms of Macular Degeneration and Retinitis Pigmentosa.**](#17dp8vu)  Teacher notes describing the set up for each challenge. | Student groups read information cards describing Macular Degeneration and Retinitis Pigmentosa and try on vision impairment goggles.   Students discuss the two diseases and assign which goggles are representative of which disease.  Students discuss their predictions of how difficult each challenge will be with the different types of vision impairment and record their predictions on worksheets. | Visual impairment goggles ‘A’ & ‘B’.  Student cards describing Macular degeneration and Retinitis pigmentosa: see **Materials for Challenges.docx**  See worksheet: **Student worksheet - Vision Challenges.docx** |  |
| [Visual impairment experience challenges](#26in1rg) | | | | | |
| 50-60 min | Teacher to select a number of challenges for the students to perform from the options provided in [**Teacher notes: Visual impairment experience challenges**.](#2s8eyo1)  Explain homework [**jigsaw box plot task**.](#lnxbz9) Assign groups to produce plots for the challenge stations, and students who will complete each box and whisker plot that represents control, Macular Degeneration and Retinitis Pigmentosa data for each challenge station. Each student from each challenge station MUST use the same scale on their number lines to represent their data so that their box and whisker plots can be compared in parallel during the next class. | See [**Teacher notes: Visual impairment experience challenges**.](#2s8eyo1)  For how to complete box plots, see the **how to create a box and whisker plot.mp4** video and [**Teacher notes – Boxplots**](#35nkun2)  Video instructions as to how students can split up the task, record their data to be ordered and graphed, and then put back together in their groups is available: **Putting Box and Whisker plot back together** | Students will complete two to three challenge stations and collect data for control, Macular Degeneration and Retinitis Pigmentosa goggles at that station.  Students record results as they perform tasks to station data sheets.  Before moving between stations students should reflect on the difficulties they encountered, the possible ways to overcome them and consider what other senses compensated for the loss of vision at their current station (the challenge station descriptions include questions for reflecting in this way).  On the challenge stations that students finish on, students are told they will need to produce box plots that represent the class data for either the control, Macular Degeneration or Retinitis Pigmentosa data. *The data from all of the challenge stations will be represented as box plots.* [**This is a homework task.**](#lnxbz9)  All students at the same station must work within the same scale on their number lines. | See **Student worksheet – Vision Challenges.docx**  For printable station descriptions and materials for these activities see **Materials for Challenges.docx** | Formative assessment can be made of students teamwork skills and ability to record data |
| [Collation of results and analysis of box and whisker plots](#44sinio) | | | | | |
|  | Teacher instructs students to place their box and whisker plots that they produced for homework onto their station worksheet.  Teacher guides students in analysing the parallel box and whisker plots for their stations in order to draw conclusions about their observations. | [**Teacher notes: Guide questions for analysing box and whisker plots.**](#2jxsxqh) | For each challenge station students put their box and whisker plots together.  Students draw conclusions about the difficulty of different tasks with different visual impairments from the class box and whisker plots and rate how difficult each task was to complete with both diseases on their worksheets. | **Challenge Station data sheets**  **Student worksheet – Vision Challenges.docx** |  |
| [Reflection of challenges encountered and comparison with experience of people living with visual impairment](#1ksv4uv) | | | | | |
| 10 min | Play short video “What it’s like to go blind”  Teacher asks students to reflect on their experience of the challenges and to compare them with the visually impaired people using **Student worksheet – Reflection Worksheet**  Teacher asks students to discuss their reflections in their groups. | Teacher notes to encourage discussion in groups (refer to above)  See [**Teacher notes - Reflection worksheet**](#z337ya) | Students watch video.  Students reflect individually using **Student worksheet – Reflection Worksheet**  Students in groups discuss their reflections about their experiences and compare them with those of people living with visual impairment. | Video of person’s experiences living with Macular degeneration: See **What It's Like To Go Blind.mp4**  Reflection worksheets |  |
| [Class discussion of group reflections and learning outcomes](#3j2qqm3) | | | | | |
| 10 min | Teacher guides class discussion around the students’ experiences of the challenges and what they have learnt about visual impairment from their experiences and the information provided during the unit. | Teacher notes with suggested methods to encourage every student to participate in the class discussion. | All students contribute to the class discussion about their experiences and what they have learnt about living with visual impairment. |  |  |