

Night Safety for children

Vasiliki Servou 14/02/2022

In the Night sensor activity students create a wearable device to give a visual and audio reminder when it is time to "Be Safe: Be Seen!" at nightfall. In this activity, students develop their understanding around road safety for children at night and explore potential solutions before planning, creating and testing a Night sensor using the BBC micro:bit.

Based on a scenario published by BBC micro:bit
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LEARNING OBJECTIVES

- to understand the issues around road safety for children at night
- to consider how technology can help children to 'Be Safe: Be Seen!'
- to design, program, test and present working prototypes using the BBC micro:bit to help children 'Be Safe: Be Seen!'
- to analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- to evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- to become responsible, competent, confident and creative users of information and communication technology
- to cultivate creative thinking
- to create a prototype
- to develop sustainable competencies
- to become more aware of social equality
- to present their work

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

CREATIVITY

AGE GROUP

From 12 to 15

SCENARIO LANGUAGE

English

TOTAL DURATION

2 hours 21 minutes

SUBJECTS

DESIGN - TECHNOLOGY

INFORMATICS / ICT

INTRODUCTION

10
MINUTES

Students consider and share the main problems around road safety for children and focus particularly vulnerable children (e.g. children with visual or hearing impairments).

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

TOOLS

Lesson slides, whiteboard, marker, notebooks, pens

SPACE FORMAT

Public

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

The teacher asks the students the following questions:

What are the main issues around road safety for children?

What risks are increased at night?

What groups of children might be especially at risk?

and the students answer them in plenary

HOW CAN TECHNOLOGY HELP?



Think-Pair-Share

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

CREATIVITY

TOOLS

Slides, Whiteboard, marker, notebooks, pens.

SPACE FORMAT

Public

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

In the first round the students individually reflect on a question or problem that requires higher-order thinking skills. In the second round the students pair up in groups of 2. After explaining their individual thoughts, they try to come to a consensus. The 3rd round is a plenary session with sharing the thoughts of the groups and a class group discussion.

Introduce the idea that technology could help with the problems identified.

Ask groups to brainstorm potential ideas - encourage them to think creatively.

Invite groups to present their (best) ideas back to class.

Night sensor

How could a night sensor help children?

Why might it be especially useful for children with hearing or visual impairments?

USING THE BBC MICRO:BIT TO HELP



Think-Pair-Share

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION

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CREATIVITY

TOOLS

Whiteboard, marker, notebooks, pens.

The teacher asks the students the following questions:

How can the BBC micro:bit help?

What types of device could be created with the micro:bit to help?

Think of ideas in your groups.

SPACE FORMAT

Public

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

In the first round the students individually reflect on a question or problem that requires higher-order thinking skills. In the second round the students pair up in groups of 2. After explaining their individual thoughts, they try to come to a consensus. The 3rd round is a plenary session with sharing the thoughts of the groups and a class group discussion.

Give each group a micro:bit and ask them to consider how it could be used to help.

Depending on your class' experience with micro:bit you may need to provide an introduction or a micro:bit running the Night sensor program to explore.

Invite groups to share their ideas.

Introduce the Night sensor and discuss how it could be used, why it might be helpful for children and especially those with hearing or visual impairments.

ALGORITHM FOR A NIGHT SENSOR

15

MINUTES

Think-Pair-Share

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

CREATIVITY

TOOLS

Whiteboard, marker, notebooks, pens.

The teacher asks the students the following questions:

Night sensor algorithm

Write an algorithm to create a Night sensor using the micro:bit.

When finished, share and debug your algorithms.

SPACE FORMAT

Public

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

In the first round the students individually reflect on a question or problem that requires higher-order thinking skills. In the second round the students pair up in groups of 2. After explaining their individual thoughts, they try to come to a consensus. The 3rd round is a plenary session with sharing the thoughts of the groups and a class group discussion.

Depending on your students' experience, you may need to introduce them to iteration, selection and variables before asking them in pairs or individually to write an algorithm for the Night sensor program.

Invite students to test and debug their algorithm with another pair.

Each group presents their algorithm.

The teacher gives examples of algorithms.

PROGRAMMING A NIGHT SENSOR

15
MINUTES

Programming your Night sensor

CREATE

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

CREATIVITY

TOOLS

Slides, Computers, whiteboard, marker, notebooks, pens

SPACE FORMAT

Public

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher-led

DESCRIPTION

The students in pairs using the MakeCode editor and their algorithms, write their Night sensor program. Encourage students to use paired programming and test and debug regularly.

You may need to talk students through the MakeCode editor and using iteration, selection and variables, depending on their experience.

The teachers reminds them to test and debug regularly.

Once finished, they download and copy to their micro:bits to test and run.

They encourage to show each other their programs and spot any differences.

They demonstrate their solutions to plenary.

REVIEW

10
MINUTES

Think-Pair-Share

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION

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CREATIVITY

TOOLS

Whiteboard, marker, notebooks, pens.

SPACE FORMAT

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POSITION OF LEARNERS

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The teacher asks the students the following questions:

What problems did you have and how did you solve them?

What have you learnt from this project?

As a class share students' learning from the project, highlighting aspects important for your students (e.g. terminology, programming skills, common issues etc.)

20
MINUTES

Presentation

CREATE

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

CREATIVITY

TOOLS

Computer presentation software (online or offline) and hardware (a projector or an LCD screen). Tools for presenting offline, e.g. flip charts with markers, mobile whiteboards etc.

SPACE FORMAT

Private, limited distraction

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher-led

DESCRIPTION

Make a presentation of your final product.

Teams of students prepare a presentation about their product and the problems they tackled, which they will then show to other students to demonstrate their findings.

EXTENSION IDEAS, STRECH & CHALLENGE

20
MINUTES

Think-Pair-Share

EXCHANGE & DISCUSS

C'S OF EDUCATION

COLLABORATION

COMMUNICATION

CRITICAL THINKING

TOOLS

Slides, Whiteboard, marker, notebooks, pens, computers

SPACE FORMAT

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POSITION OF LEARNERS

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Students develop the algorithm and write the program for their own innovation using the micro:bit to help children stay safe at night, developing their initial ideas, or developing new ones.

Students develop the algorithm and write the program for additional features to their Night sensor.



Think-Pair-Share

EXCHANGE & DISCUSS

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Quiz

ASSESSMENT & FEEDBACK

C'S OF EDUCATION

COMMUNICATION

CRITICAL THINKING

TOOLS

Online quiz platform and a quiz prepared by the teacher in advance.

SPACE FORMAT

Private, limited distraction

POSITION OF LEARNERS

Small groups

ROLE OF TEACHER

Teacher at the side

DESCRIPTION

A short, ungraded online quiz to check for understanding (True/False, multiple choice, matching, etc.). Students can discuss their answers in pairs before answering. Both students and the teacher receive immediate feedback. Depending on the type of quiz (with questions displayed on the main screen or on students' devices only), the teacher can provide general feedback for the whole class group or students can work independently on the feedback provided on their screens.



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