Emotion Communicator Workshop

A micro:bit makecode project (mentor guide)

Emotion Communicator Project

Printed resources list:

autism background

initial use case scenario

reference makecode solution without any instructions

Materials list:

micro:bit (2off)

pad of paper

pencil

phase 0: introduction to a potential use case scenario

introduction:

- verify understanding with a bit of background – the things an autistic person would find difficult or unpleasant.
- hand out the initial proposed scenario and get any ideas for amendments from dojo.

Use case scenario:

A young autistic person is (scared | confused | anxious | worried | unhappy | sad | upset) || (ok | not bad | fine) || (happy | having fun | excited) about something, so she chooses that emotion and then chooses how much she feels this. She then sends the emotion and how much to her friend | sibling | adult | parent | teacher.

friend | sibling | adult | parent | teacher receives the young persons' emotion and how much message, then sends back an OK (acknowledgement) message to communicate that the message has been seen | heard.

Young person receives the friend | sibling | adult | parent | teacher OK message, so ends the communication.

phase 1: AFK (Away From Keyboard)

From the use case scenario, coders identify the actors and roles needed. Something like:

child
childs_friend

From the use case scenario, coders identify (from verbs) as many of the required **problem domain functions** as possible. Something like:

<u>for the autistic child:</u>

chooseEmotion
chooseHowMuch
sendEmotionAndHowMuch
receiveOkMessage

<u>for the friend:</u>

receiveEmotionAndHowMuch
sendOkMessage

phase 2: Coding and Making

coders divide the development work by organising themselves into 2 or 3 groups or
individuals responsible for:

1. programming the childs_device
2. programming the childs_friends_device
3. writing the user instruction manual
4. designing and making the box | wearable to house the micro:bit devices

user instruction manual for reference solution:

Autistic Child's device:

button A   ==   scroll through options
button B   ==   select and option
button A+B ==   send emotion an how much to my friend
shake   ==   reset at any time to start again
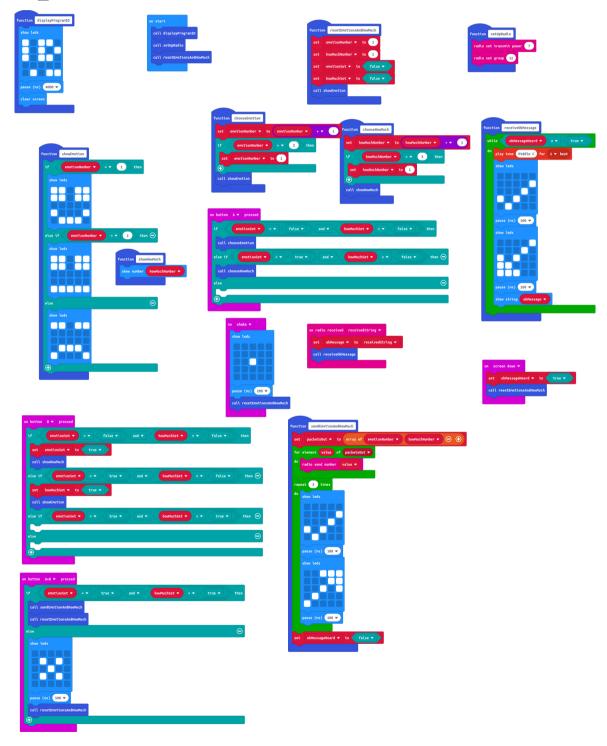face down   ==   end comms after my friend has sent me an OK messages

Friends device:

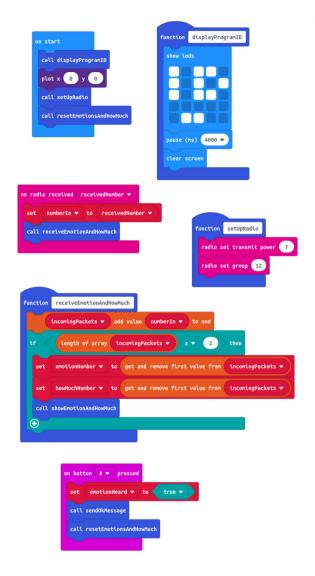button A   ==   send OK acknowledgement message

childs_device

```
function displayProgramID
  show leds
  [LED pattern]
  pause (ms) 4000
  clear screen
```

```
on start
  call displayProgramID
  call setUpRadio
  call resetEmotionsAndHowMuch
```

```
function resetEmotionsAndHowMuch
  set emotionNumber to 1
  set howMuchNumber to 1
  set emotionSet to false
  set howMuchSet to false
  call showEmotion
```

```
function setUpRadio
  radio set transmit power 7
  radio set group 12
```

```
function chooseEmotion
  set emotionNumber to emotionNumber + 1
  if emotionNumber > 3 then
    set emotionNumber to 1
  call showEmotion
```

```
function chooseHowMuch
  set howMuchNumber to howMuchNumber + 1
  if howMuchNumber > 3 then
    set howMuchNumber to 1
  call showHowMuch
```

```
function receiveOkMessage
  while okMessageHeard ≠ true do
    play tone Middle C for 1 beat
    show leds
    [LED pattern]
    pause (ms) 100
    show leds
    [LED pattern]
    pause (ms) 100
    show string okMessage
```

```
function showEmotion
  if emotionNumber = 1 then
    show leds
    [LED pattern]
  else if emotionNumber = 2 then
    show leds
    [LED pattern]
  else
    show leds
    [LED pattern]
```

```
function showHowMuch
  show number howMuchNumber
```

```
on button A pressed
  if emotionSet = false and howMuchSet = false then
    call chooseEmotion
  else if emotionSet = true and howMuchSet = false then
    call chooseHowMuch
  else
```

```
on shake
  show leds
  [LED pattern]
  pause (ms) 200
  call resetEmotionsAndHowMuch
```

```
on radio received receivedString
  set okMessage to receivedString
  call receiveOkMessage
```

```
on screen down
  set okMessageHeard to true
  call resetEmotionsAndHowMuch
```

```
on button B pressed
  if emotionSet = false and howMuchSet = false then
    set emotionSet to true
    call showHowMuch
  else if emotionSet = true and howMuchSet = false then
    set howMuchSet to true
    call showEmotion
  else if emotionSet = true and howMuchSet = true then
  else
```

```
function sendEmotionAndHowMuch
  set packetsOut to array of emotionNumber howMuchNumber
  for element value of packetsOut
  do
    radio send number value
  repeat 3 times
  do
    show leds
    [LED pattern]
    pause (ms) 100
    show leds
    [LED pattern]
    pause (ms) 100
  set okMessageHeard to false
```

```
on button A+B pressed
  if emotionSet = true and howMuchSet = true then
    call sendEmotionAndHowMuch
    call resetEmotionsAndHowMuch
  else
    show leds
    [LED pattern]
    pause (ms) 500
    call resetEmotionsAndHowMuch
```

childs_friends_device

```
on start
    call displayProgramID
    plot x 0 y 0
    call setUpRadio
    call resetEmotionsAndHowMuch
```

```
function displayProgramID
    show leds
    [LED grid pattern]
    pause (ms) 4000
    clear screen
```

```
on radio received receivedNumber
    set numberIn to receivedNumber
    call receiveEmotionAndHowMuch
```

```
function setUpRadio
    radio set transmit power 7
    radio set group 12
```

```
function receiveEmotionAndHowMuch
    incomingPackets add value numberIn to end
    if length of array incomingPackets ≥ 2 then
        set emotionNumber to get and remove first value from incomingPackets
        set howMuchNumber to get and remove first value from incomingPackets
        call showEmotionAndHowMuch
```

```
on button A pressed
    set emotionHeard to true
    call sendOkMessage
    call resetEmotionsAndHowMuch
```

```
function showEmotionAndHowMuch
    while emotionHeard ≠ true
    do
        start melody power up repeating once
        if emotionNumber = 1 then
            show leds
            [LED grid pattern]
        else if emotionNumber = 2 then
            show leds
            [LED grid pattern]
        else if emotionNumber = 3 then
            show leds
            [LED grid pattern]
        if howMuchNumber = 1 then
            show number 1
        else if howMuchNumber = 2 then
            show number 2
        else if howMuchNumber = 3 then
            show number 3
        pause (ms) 200
        pause (ms) 200
```

```
function resetEmotionsAndHowMuch
    set emotionNumber to 0
    set howMuchNumber to 0
    set emotionHeard to false
    set incomingPackets to empty array
    plot x 0 y 0
```

```
function sendOkMessage
    radio send string "OK"
    repeat 3 times
    do
        show string "Ok"
        show leds
        [LED grid pattern]
        pause (ms) 200
        show leds
        [LED grid pattern]
        pause (ms) 200
    clear screen
```