結合運算思維的教學單元設計比賽

英文科：Writing a story

概述

本單元共有兩個教節，共 70 分鐘，旨在利用運算思維概念，透過 Scratch 平台，為語文學習加添 ‘context’ 及 ‘authentic application’ 的元素。建議英文科老師可先完成 WS1（著學生設計簡單故事對白），再進行此單元教學。

本單元最重要的理念是把語文教材和應用的 scratch 平臺結合在一起。程式的第一部分是教學部分，學生可以在聲畫同步的情況下學習，而互動的教材讓學生體驗這單元的運算思維概念是如何運作的。教師可以在學生體驗互動教材後，引導學生找出相關的程式塊，嘗試替程式除錯，籍以完成數字 1-5 的動畫。

為了方便學生，程式內分為三種角色：

1 旁白（scratch cat) ：程式碼完全不需要修改；

2 體驗（show1-5) ：部分程式碼需要修改；

3 主角（character1-2) ：程式的造型，程式都需要/可以進行大規模修改。

接著是第二部分，程式首先讓學生進行最基本的改動，讓他們跟進一步體驗這個單元的運算思維的應用及運作，也藉此讓他們進行自我表達，數碼通權及作為與其他同學進行互評的材料。學生會被引導先與 Scratch Cat 進行互動，然後隨指示按下各個數字，體驗 Broadcast 的功能，最後留意指示回答問題，填寫 red crewmate 與 dinosaur 的對白，讓學生能夠體驗是次課堂的目標成品，引起學生的學習興趣及動機。

這手法不但方便教學，而且學生能按照自己的進度進行學習，每個學生可以按照自己的能力添加更進階的運算思維概念應用。學生回家後，也可以很方便地進行自習，學習時，也再不用再教學指引過平臺之間不停切換。

為了讓學生能更方便快捷地進行修改，編寫時特意進行了一些模組化的編程，藉以方便學生透過複製給稍微作出更改而發展出自己的程式。

如教師想加強有關編程部份的教學，可著學生查看每個數字的程式，然後著學生說中其中對似及不同的地方，從而引入廣播的概念。

而最後的部分以寫作課作為概念，鼓勵學生不斷修改和除錯（對白和程式）。

學科結合

學科： 英文科

相關單元： 小學四年級 4B Unit 1 – Dialogues, Stories, future tense

學科教學應用： 運用 scratch 平台編制故事

於本單元，學生會隨著程式的指引，體驗到廣播及接收的用途。學生會先體驗到廣播和接收的用途（數字 1-5。在引入時，特意把廣播和接收放在不同的程式組別中，令學生能分清廣播及接收；另外，製作教材時特意把程式的用樣貌攝取成角色的外貌，方便學生辨認。體驗時，學生會發現數目字 3 的程式未完成，不能使下一個數字出現。手此時學生需進行除錯，連接數字 3-4 的廣播程式。

然後程式會引導學生輸入對白從而完成最基本的故事。透過這程式演活學生編寫的對白，增加學生寫作的興趣；而且程式會提示學生進行修改，從而培養他們寫作的好習慣。程式增加了朗讀功能和角色的動畫，從不同的感官手刺激的學生的興趣，亦同時照顧了學生的學習差異，方便學生進行修改及互評。

教材附有兩張工作紙。《WS1：writing dialogues》先讓學生構想故事的對白，於紙張上寫信對白內容，並請其他同學閱讀及修改。

《WS2：additional dialogues》則讓學生進一步思考如何透過運算思維實踐中的算法思維，在程式中的運用模組化增加對白。過程中，學生可以重用已提供的程式，運用運算思維實踐中的反覆構思 及漸進編程，以及測試及除錯。

完成程式後，老師於教節末部份著學生分享自己的故事，及介紹他們使用了的程式，同步發生，以為讓其他進行評價及提議。完成在全班的分享及互評後，學生各找一位同學透過《課後反思工作紙》，想一想學過的內容及其他可能的用途。

課程延伸老師鼓勵學生透過複製及更改模組化的程序來加入新的對白來延長故事，使程式變得更有趣，並加引導學生加入同步發生的話劇效果，如加入聲效，改變造型，更改角色位置，及更換背景等。

相關單元：運算思維發展（級別一）「用 scratch 說笑話」

預期學習成果

完成本單元後，學生能夠：

1. 以將來式編寫對白
2. 製作簡單故事
3. 運用運算思維概念中的事件、程序、同步發生和變數（和清單）來創建程式；
4. 運用運算思維實踐中的重用及整合，來編寫互動故事；
5. 運用運算思維實踐中的反覆構思及漸進編程，以及測試及除錯來完成程式。
6. 透過編寫程式進行自我表達，與生活聯繫及數碼充權

本單元運用到的運算思維概念、實踐和視野：

● 運算思維概念	● 事件 ● 序列 ● 同步發生 ● 重用 ● 整合 ● 命名
● 運算思維實踐	● 算法思維 ● 反覆構思及漸進編程 ● 測試及除錯
● 運算思維視野	● 與生活聯繫 ● 提問與了解 ● 自我表達

教材內容

兩個教節的教學和學習材料詳列於下列附件，包括程式的完整版本及範本 sb3 手 檔。

1. 《WS1：Writing Dialogues》
2. 《WS2：Additional Dialogues》
3. 《WS3：Reflection》
4. Story telling.sb3

Lesson plan

Lesson 1 (35 min)

Introduction (3 min)	Teacher shows a screen shot of the video game 'Among us'. Teacher asks students if they know the game. Teacher asks students who know the game to tell the class how to play. Teacher introduces how to play the game – by typing dialogues
Pre-task (5 min)	Teacher presents WS1 and introduce the dinosaur and red crewmate. Teacher elicits dialogues from students as dinosaur and red crewmate. Teacher asks student to what the red crewmate can give the dinosaur so that it won't eat him.
Task(10min)	Teacher divides students into groups of 2 and ask them brainstorm and then rehearse the dialogue.
Task(10min)	Teacher asks 1-2 group to read their dialogues to the whole class and elicit comment on their performance from the class.
Post task (5 min)	Teacher concludes the comment and highlights what students should pay attention in their peer-editing.
Consolidation (2min)	Teacher ask "What text type has we learnt today?" (Dialogues) "What tense do we use in a dialogue?" (Present tense, Future Present perfect tense)

Lesson 2 (35 min)

Introduction (5 min)	Teacher shows the scratch program and click along to let the program do the teaching. Teacher show students how to connect the code in '3' and '4'. Teacher then reminds students to log into their scratch platform before commencing.
Task 1 (10 min)	Teacher demonstrate how to input the dialogue in WS 1 into the scratch to animate the dialogues. Teacher let students input their edited dialogues.
Task 2 (10min)	Teacher present WS 2 and ask students to write additional dialogues in their previous group.
Task(3min)	Teacher asks 1-2 group to read their dialogues to the whole class and elicit comment on their performance from the class.
Post task (5 min)	Teacher demonstrates how to share the scratch project and goes through the reflection WS with students.
Consolidation (2min)	Teacher ask "What platform has we used today?" (scratch) "How to we comment on other's work?" (Reviewer's page: one thing he/she did well & one thing he/she could do better)

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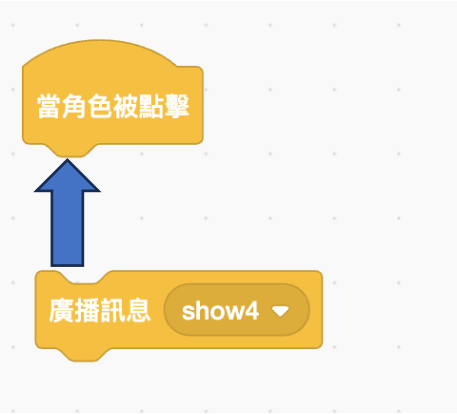
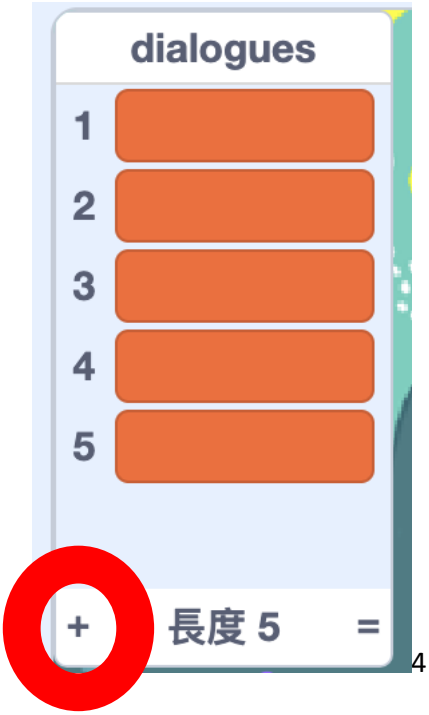
數學動畫 3-4 需要連結的部份



對白設計 (清單：透過互動指示完成，然後真接進行修改及除錯)

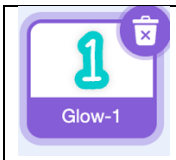


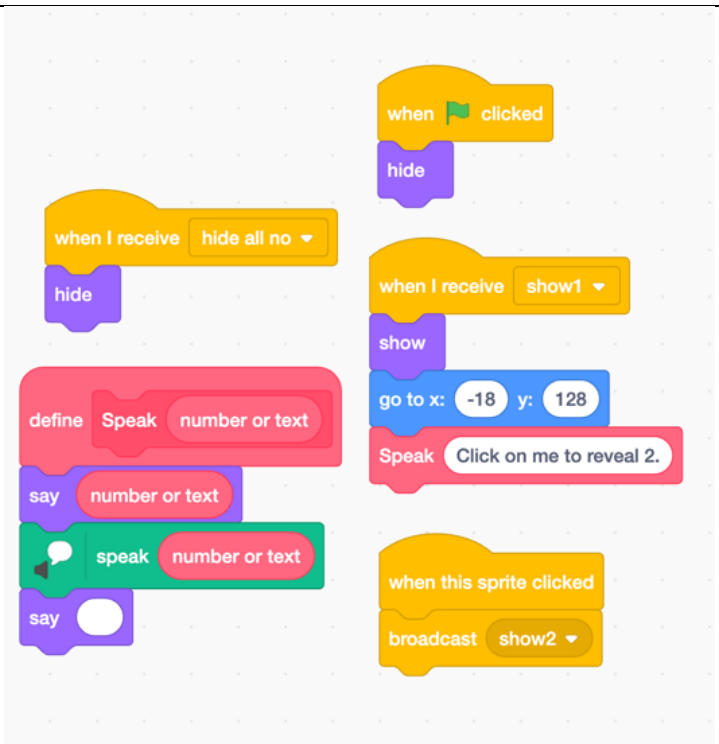
4

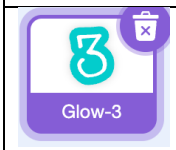
挑戰任務：

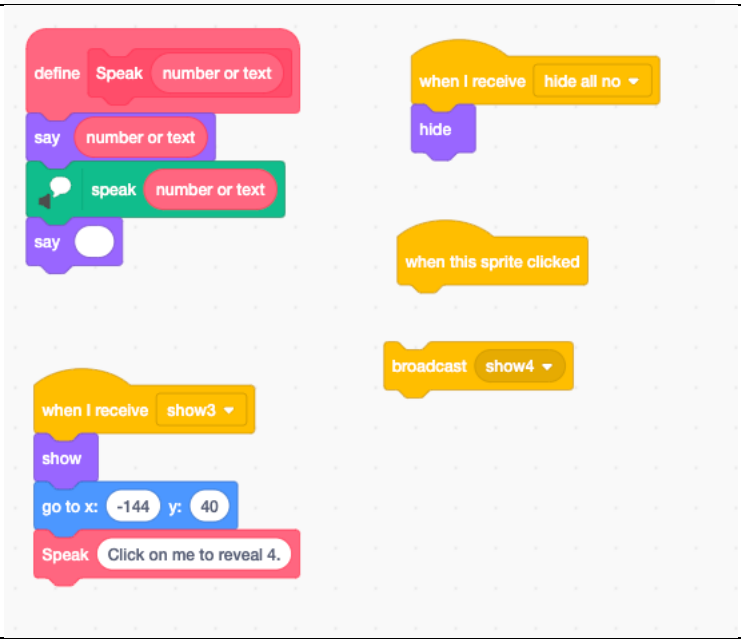
加入聲效及移動效果

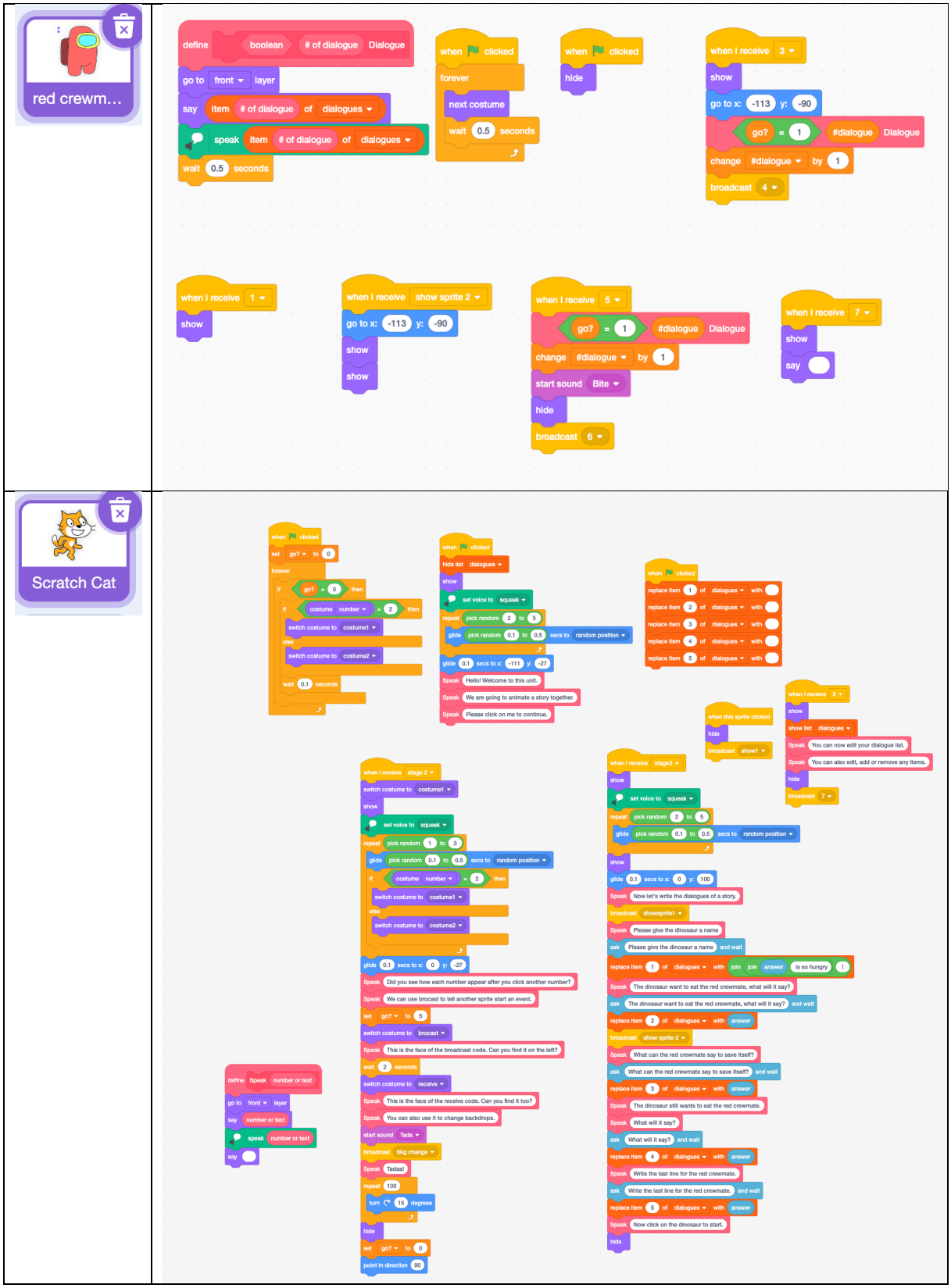
Code blocks


1
Glow-1

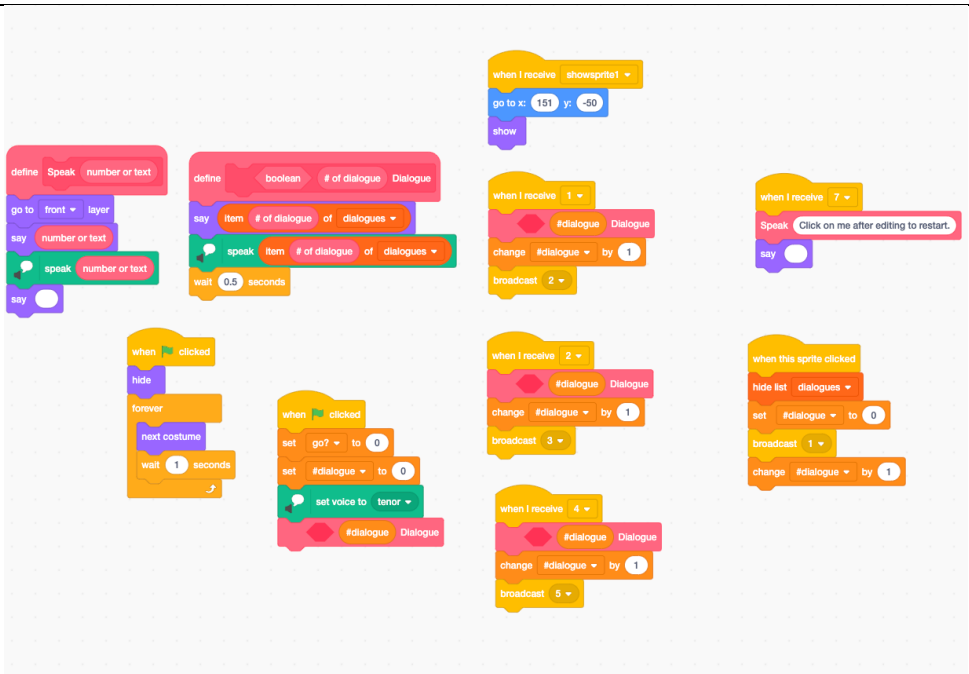

when clicked
hide
when I receive hide all no
hide
when I receive show1
show
go to x: -18 y: 128
Speak Click on me to reveal 2.
define Speak number or text
say number or text
speak number or text
say
when this sprite clicked
broadcast show2


3
Glow-3


define Speak number or text
say number or text
speak number or text
say
when I receive hide all no
hide
when this sprite clicked
broadcast show4
when I receive show3
show
go to x: -144 y: 40
Speak Click on me to reveal 4.


red crewm...
define boolean # of dialogue Dialogue
go to front layer
say item # of dialogue of dialogues
speak item # of dialogue of dialogues
wait 0.5 seconds
when clicked
forever
next costume
wait 0.5 seconds
when clicked
hide
when I receive 3
show
go to x: -113 y: -90
go? = 1 #dialogue Dialogue
change #dialogue by 1
broadcast 4
when I receive 1
show
when I receive show sprite 2
go to x: -113 y: -90
show
show
when I receive 5
go? = 1 #dialogue Dialogue
change #dialogue by 1
start sound Bite
hide
broadcast 6
when I receive 7
show
say
Scratch Cat
when clicked
set go? to 0
forever
if go? = 0 then
if costume number = 2 then
switch costume to costume1
else
switch costume to costume2
wait 0.1 seconds
when clicked
hide list dialogues
show
set voice to squeak
repeat pick random 2 to 5
glide pick random 0.1 to 0.5 secs to random position
glide 0.1 secs to x: -111 y: -27
Speak Hello! Welcome to this unit.
Speak We are going to animate a story together.
Speak Please click on me to continue.
when clicked
replace item 1 of dialogues with
replace item 2 of dialogues with
replace item 3 of dialogues with
replace item 4 of dialogues with
replace item 5 of dialogues with
when this sprite clicked
hide
broadcast show1
when I receive 6
show
show list dialogues
Speak You can now edit your dialogue list.
Speak You can also edit, add or remove any items.
hide
broadcast 7
define Speak number or text
go to front layer
say number or text
speak number or text
say
when I receive stage 2
switch costume to costume1
show
set voice to squeak
repeat pick random 1 to 3
glide pick random 0.1 to 0.5 secs to random position
if costume number = 2 then
switch costume to costume1
else
switch costume to costume2
glide 0.1 secs to x: 0 y: -27
Speak Did you see how each number appear after you click another number?
Speak We can use brocast to tell another sprite start an event.
set go? to 5
switch costume to brocast
Speak This is the face of the broadcast code. Can you find it on the left?
wait 2 seconds
switch costume to receive
Speak This is the face of the receive code. Can you find it too?
Speak You can also use it to change backdrops.
start sound Tada
broadcast bkg change
Speak Tadaa!
repeat 100
turn 15 degrees
hide
set go? to 0
point in direction 90
when I receive stage3
show
set voice to squeak
repeat pick random 2 to 5
glide pick random 0.1 to 0.5 secs to random position
show
glide 0.1 secs to x: 0 y: 100
Speak Now let's write the dialogues of a story.
broadcast showsprite1
Speak Please give the dinosaur a name
ask Please give the dinosaur a name and wait
replace item 1 of dialogues with join answer is so hungry !
Speak The dinosaur want to eat the red crewmate, what will it say?
ask The dinosaur want to eat the red crewmate, what will it say? and wait
replace item 2 of dialogues with answer
broadcast show sprite 2
Speak What can the red crewmate say to save itself?
ask What can the red crewmate say to save itself? and wait
replace item 3 of dialogues with answer
Speak The dinosaur still wants to eat the red crewmate.
Speak What will it say?
ask What will it say? and wait
replace item 4 of dialogues with answer
Speak Write the last line for the red crewmate.
ask Write the last line for the red crewmate. and wait
replace item 5 of dialogues with answer
Speak Now click on the dinosaur to start.
hide

Dinosaur


define Speak number or text
go to front layer
say number or text
speak number or text
say
define boolean # of dialogue Dialogue
say item # of dialogue of dialogues
speak item # of dialogue of dialogues
wait 0.5 seconds
when I receive showsprite1
go to x: 151 y: -50
show
when I receive 1
#dialogue Dialogue
change #dialogue by 1
broadcast 2
when I receive 7
Speak Click on me after editing to restart.
say
when clicked
hide
forever
next costume
wait 1 seconds
when clicked
set go? to 0
set #dialogue to 0
set voice to tenor
#dialogue Dialogue
when I receive 2
#dialogue Dialogue
change #dialogue by 1
broadcast 3
when this sprite clicked
hide list dialogues
set #dialogue to 0
broadcast 1
change #dialogue by 1
when I receive 4
#dialogue Dialogue
change #dialogue by 1
broadcast 5