

How to create a Number Bonds game using Scratch



The following instructions will guide you step by step through the process of creating a Number Bond maths game.

Create your backgrounds.

- Open up Scratch . Click on the stage and then choose the backgrounds tab.
- Click on edit.
- Design your background using the paint editor. (Alternatively you can find a background image online and import a new background.)
- Click OK.
- To create your second background click on the paint button to open up the paint editor again. Design your second background and click OK.
- Rename your backgrounds Game Play and Game Over.
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Import your first Sprite

- Click on Sprite 1 and select the costumes tab. Click on import and choose a sprite to be your question master. Try and find one that has a simple facial expression.
- Click on import again and choose the same sprite you chose in the previous step and repeat.
- Edit each of your sprites so they have a talking expression, a happy expression and a sad expression.
- Rename your sprite costumes to talking, happy and sad.



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Create your second sprite.

- Click on the paint a new sprite icon.
- In the paint editor draw a 0 and click ok.
- Click on the paint button and draw a number 1 and click OK.
- Repeat until you have numbers 0 to 10 in the costumes for sprite 2.
- Rename the costumes numero to number10 accordingly.

Write your first stage script.

- Click on the Stage and then click on the Backgrounds tab.
- Select your first background and click on the Scripts tab.
- The first thing we want to is create a score variable. Click on Variables and then Make a Variable. Name the variable 'Score'.
- Now click Control and choose . Click on variables and drag the  underneath your first block and link them.
- We now want to make sure we have the right background when we start the game. Click on Looks and choose  and click on the arrow to ensure that Game Play is selected. Link to your other blocks.

Write your first sprite script.

- Select Sprite 1 and click on the Scripts tab.
- Our first step for this sprite is to create a new variable called Number Bond. Click on Variables and then Make a Variable. Name the variable Number Bond. Choose for all sprites.
- Untick the box next to this block to stop it being displayed on the stage.
- Click on Control and select  and drag it into the scripts area.
- We want to introduce ourselves, so click on Looks and drag  into the scripts area and link it to your first block. Now click on Sensing and drag  into the scripts area and link to the other blocks.

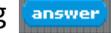


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Write your first sprite script CONT

- Now let's welcome our contestant. Click on Looks and drag  into the scripts area. We want to change our message so it includes our contestants name. We need more than one 'say' for this so we need to use the 'join' script.
- Click on Operators and drag 2 join scripts into the scripts area. Drag one join script onto the other join script and place in the section that says 'world'. 
- Click on sensing and drag  to the second 'hello' on your join scripts.
- Change your message. 
- Click on Look and choose 'say' again. Change the message to 'Let's begin.'
- Click on Variables and drag  into the scripts area. Click on the arrow and change from Score to Number Bonds. Lock it into your other blocks.
- We now need to tell the game that we are about to be begin. Click on Control and drag  into the script area. Click on the arrow and select new. Type in Let's begin into the message box and click OK.
- Link to the other blocks.

Write your next sprite script.

- Our next script picks our numbers and helps our quiz master decide what to say if the contestant get the answer right or wrong.
- Make sure you have Sprite 1 selected and that you are in the scripts area.
- We need to let our sprite know what to do when the quiz has begun so click on Control and drag  into the scripts area.
- We want the scripts to keep repeating so drag  into the scripts area and link to the first block.
- Our number bonds need to be picked randomly so click on Variables and drag  into the scripts area. Click on the arrow and select Number Bond.
- Click on Operators and drag  into the scripts area. Join the operator block to the variable block where the 0 is.  Place the block in the forever block.
- Now let's ask the question. Click on sensing and drag the  into the scripts area.
- Click on Operators and drag 2 'join' blocks into the script area.

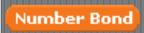
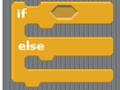


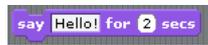
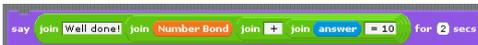
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Write your next sprite script CONT

- Join your 2 operator blocks together.
- Click on variables and drag  into the middle box on the join blocks. 
- Move the 'join' block into the 'ask' block and change the message to 
- Move this block to sit underneath the last one within the forever block.
- We now need to have some choices depending on whether answer given is right or wrong.
- Click on control and drag  into the scripts area.
- Click on operators and drag  and  into the scripts area. Drag the second block onto the first block to the left of the = sign.
- Click on sensing and drag  into the scripts area.
- Click on variables and drag  into the scripts area.
- Drag the last two blocks onto the operators blocks and type in 10 after the equals sign. 
- Place this block into the if/else block. 

- Now let's tell our sprite what to do if the contestant gets the answer right.
- Click on looks and drag 2  blocks and 1  block into the scripts area.
- Change one of your switch costumes to happy and the other one to talk.
- Click on Operators and drag 4  blocks onto the script area. Join the 4 blocks. 
- Click on variables and drag the 'Number Bond' block into the scripts area.
- Click on sensing and drag the 'answer' block into the scripts area.
- Drag your 'Number Bond' block into the 'join' block.
- Drag your 'answer' block into the 'join' block. 
- Drag your 'join' blocks into your 'say'  block.
- Click on Operators and drag a 'broadcast' block into the scripts area. Click on the down arrow and select new. Type in Well done! into the message box.

- Drag your blocks into the 'if' block.

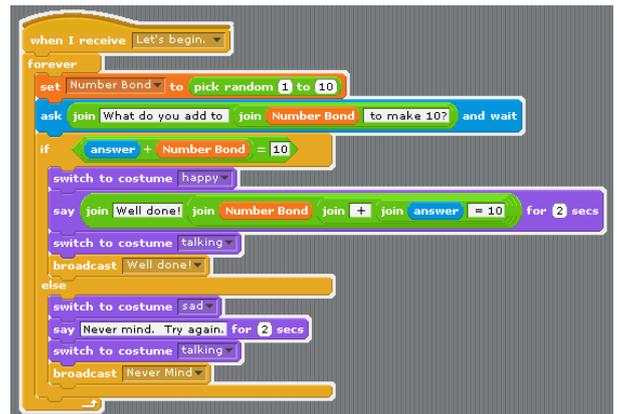
```
if  $answer + Number\ Bond = 10$ 
  switch to costume happy
  say join Well done! join Number Bond join + join answer = 10 for 2 secs
  switch to costume talking
  broadcast Well done!
else
```

Write your next sprite script CONT

- What happens if we don't get the question right.
- Click on Looks and drag 2 'switch costume' blocks 1 'say' block into the scripts area.
- Change 1 'switch costume' block to say sad and the other to say talking.
- Type in 'Never mind. Try again.' into your say block.
- Click on Control and drag a 'broadcast' block into the scripts area. Click on the arrow and select new. Type in Never Mind into the message box and click ok.
- Drag your blocks into the else block.



- Drag your 'if/else' block into your forever block.



Write your number sprite scripts.

- Now we need to get our numbers to appear on the screen and change according to our question.
- Click on sprite 2 and make sure you are in the scripts area.
- We don't want our numbers to show until we start asking our questions so we need to hide our sprite. Click on Control and drag the 'When flag clicked' block into the scripts area.
- Click on Looks and drag the 'hide' block into the scripts area.
- Join the 2 blocks.
- We don't want our numbers to show when we are talking to our contestant, so we need to hide them at these points.
- Click on Control and drag 2 'When I receive' blocks into the scripts area. Click on the arrow on these blocks and change one to say never mind and the other one to say well done.
- Click on Looks and drag 2 'hide' blocks into the scripts area and join them to your 'broadcast' blocks.

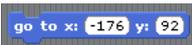


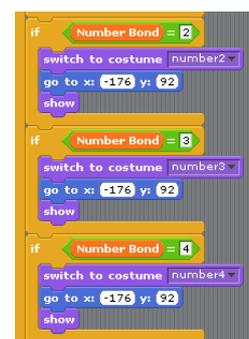
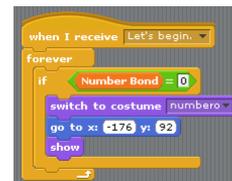
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Write your number sprite scripts CONT

- We now need to tell our number sprite when to appear and which costume to choose.
- Click on your number sprite and look at the stage area to see where it is positioned. Move the sprite around until you are happy with it's position.
- Click on the scripts tab.
- Click on operators and drag a 'When I receive' block into the scripts area.
- Click on the arrow and select Let's begin.
- Drag a 'forever' block into the scripts area join it to the 'When I receive' block.
- Drag an 'if' block into the scripts area.
- Click on Operators and drag  into the scripts area.
- Click on Variables and drag the 'number bond' block into the left hand square on your '=' block.
- Type 0 into the left square on your '=' block. 
- Drag your "=" block into your "if" block.
- Click on Looks and drag a 'switch to costume' block into the scripts area.
- Click on the arrow and choose 'number0'. Move your block into the 'if' block.
- Click on motion and drag the  block into the scripts area. (The x and y is the position that your sprite will be on the screen.)
- Drag this block underneath the 'switch to costume' block.
- Click on looks and drag the 'show' block underneath the 'go to x: y:' block.
- Right click on this block and duplicate 10 times. Change the number in the 'if' block for each script and change the costume to correspond with this number.
- Join all these scripts and then move them inside your 'forever' block.

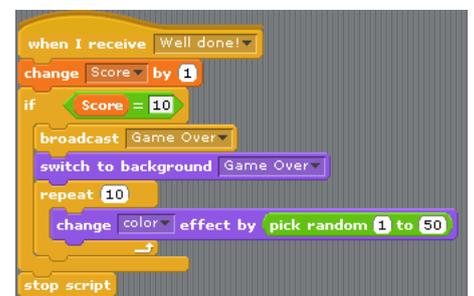


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Set up your scoring.

- Let's set up a scoring system to keep track of all those right answers. We can also use it to stop the game when the contestant has got 10 right answers.
- Click on Control and drag 'when I receive' into the script area. Click on the arrow and choose 'Well done!'.
- Click on Variables and drag  into the scripts area. Click on the arrow if it does not say 'score' and change.
- Join this block underneath the 'when I receive' block.
- Click on Control and drag the 'if' block underneath the 'when I receive' block.
- Click on Operations and drag the '=' block into the 'if' block. Click on variables and drag 'score' into the left hand side of the '=' block. Type in 10 into the right hand side of the '=' block.
- Drag a 'broadcast' block into the middle of the 'if' block.
- Click on the arrow on the 'broadcast' block choose new. Type 'Game Over' in the message box.
- Click on Looks and drag the 'switch to background' block under the 'broadcast' block. Click on the arrow and choose 'Game Over'.
- Click on Control and drag a 'repeat' block under the 'switch to background' block.
- Click on looks and drag the 'change _ effect by' block under the repeat block.
- Choose an effect to change by clicking on the arrow.
- Click on Operations and drag the 'pick random' block into the 'change _ effect by' block.



One last script.

- We need to stop those numbers appearing when the game is over.
- Click on your number 2 sprite and make sure you are on Scripts.
- Click on Control and drag the 'When I receive' block into the scripts area.
- Click on Looks and drag 'hide' underneath 'When I receive' block.



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