

On a piece of paper, draw a triangle (any triangle -right angled, equilateral, isosceles, scalene). Color one of the vertices red, the second blue, and the third green.

Next, take three dice - one red, one blue, and one green.

Now draw a point in the triangle. This point is the *seed* for the game. Then roll the die.

Whichever die shows the highest number (throw again if there is a tie for the highest), draw a point halfway inbetween the seed and the appropriately colored vertex. Now do the same, using your new point as the seed for the next. After a few rolls you might have a drawing like this:

Figure 1: Playing the game with rolls of red, green, blue, blue.

Now continue in this fashion for five rolls of the dice. Then rub out all the points except the most recent seed and the coloured points.

Now carry on but don't erase any points.

Can you guess what pattern your points are going to make?

Geogebra instructions



Use the polygon tool to draw a triangle.

You can right click on a vertex and select “Object Properties” to change the colour.

Change them so that you have red, blue, green.



Make a new point inside the triangle

And then type the following into the Input Bar:

`RandomBetween(1, 3)`

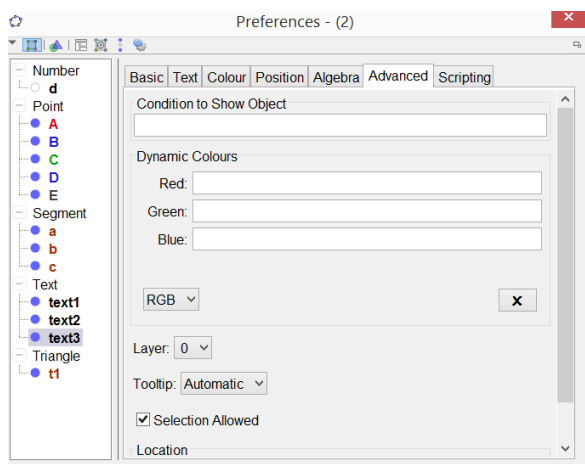
This will give you a random integer between 1 and 3. If you press Ctrl+R it will refresh and give you a new number (or the same one!)



Use this icon to make a new textbox. Type in “Move halfway to blue”. Then, with the



selected, right click on the text you have written and choose “Object Properties”. Go to the Advanced tab and type $d=1$ into the Condition to Show Object box (or whatever letter your random number has been stored under). Then click in any other box and then close the box with the red cross. Then try pressing Ctrl+R a few times to see what happens.



Make this work for red and green too.



You can now use the midpoint tool to play the game on Geogebra, following your own instruction pressing Ctrl+R each time!

Automatically on Geogebra!

1. Create a slider
2. Create the point P and set its trace on. Make P size 1 by right clicking on object properties.
3. Create the triangle ABC.
4. Right click on the slider and go to "Object properties". Add this piece of code to the Scripting > On Update setting for the slider:

```
T=If[RandomBetween[1,3]==1,A,If[RandomBetween[1,2]==1,B,C]]  
P=Midpoint[T,P]
```
5. Right click on slider to animate it.
6. Does it work perfectly? If not, can you change the code to make it work.

```
T=If[RandomBetween[1,3]==1,A,If[RandomBetween[1,2]==1,B,C]]  
P=Midpoint[T,P]
```

```
T=If[RandomBetween[1,4]==1,A,If[RandomBetween[1,3]==1,B,If[RandomBetween[1,2]==  
1,C,D]]]  
P=Midpoint[T,P]
```