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JellyBird for AutoSTEM - Use and construction instructions

This guide has 2 parts:

1. How the Jellybird can be used to introduce a number of mathematical concepts
2. How to construct the jellybird (your children can make the jellybird)

The construction and use of the Jellybird allows the teaching of a number of mathematical concepts within the construction and assembly process.

On finalisation, the Jellybirds, can then be used in additional ways. Some ideas include,



- Creating groups that mimic how flocks of birds fly together, here are 2 examples:
 - Starlings murmuration: <https://www.youtube.com/watch?v=eakKfY5aHmY>
 - Flying with geese <https://www.youtube.com/watch?v=XYdPnuGXo78>
- Bringing preschool in to the home. The birds could be used within a bedtime story. Here's a freely available example <https://www.storyjumper.com/book/index/20310568/The-Bird-Who-Couldn-t-Fly#>
- Adding additional wing shapes (also opportunities for other geometric shapes)

1. Introducing Mathematical Concepts

When the children colour the Jellybird, they have to use their **spatial imagination** to visualise how the parts will fit together and what the bird will finally will look like. The teacher talks with the children about the different parts, their **shapes** and **placement**:

- The body is *round*, but not a *circle*. It is *oblong* and *pointed* at one end. There is a *left-hand side* and a *right-hand side* of the body.
- The wings are *rectangles*. A rectangle has *four sides* and is *oblong*. There will be one wing on *either side* of the bird.
- The eyes are *round*, almost like *circles*. There will be one eye on *either side* of the body.
- The beak is a *triangle*. It has *three corners*. The *sharp corner* points *outwards*. The bird uses the beak to pick. The beak will be *in the front*.
- The tail is a *trapezium*. It has *four sides*. The *widest side* points *outwards*. The bird uses the tail to steer. The tail will be *in the back*.

Since we need two supports that have to be cut out of carton material, the teacher talks about the concept *twice*. The children use *one* template *twice* to get *two* supports.



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When the children stick the beak and the tail to the body, the teacher talks about the *inside* and *outside* of the bird. The children have to stick the beak and the tail to the *inside*. Furthermore, the teacher uses the concepts *round* and *pointed*. The children have to stick the beak to the *round* side and the tail to the *pointed* side.

When pushing the support that carries wings through the body, the teacher can talk with the children about the mathematical concepts *narrow* and *through*. The support has to go *through* the *narrow* gap.

When bending the wings, the teacher talks with the children about the concepts *down*, *either side*, *left-hand side* and *right-hand side*. The children have to bend the wings *down* on *either side*, one on the *left-hand side* and one on the *right-hand side* of the bird. The wings are *symmetrical*, they have a *mirror symmetry*, i.e. they look the same on *either side* but point in different directions – one *to the left* and one *to the right*.

When playing with the bird, the teacher talks with the children about *motion* and the concepts *up* and *down*. We move the support *up* and *down*. The wings flap *up* and *down*. The bird flies upward in the air and then forward.



Images of 4 and 5 year olds making the Jellybird



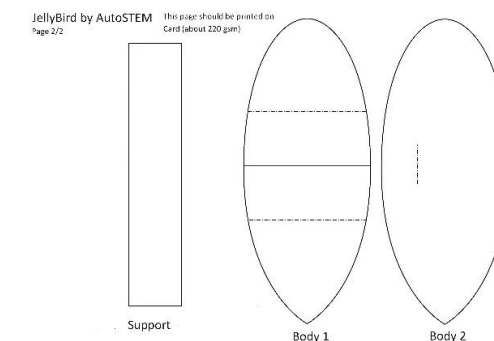
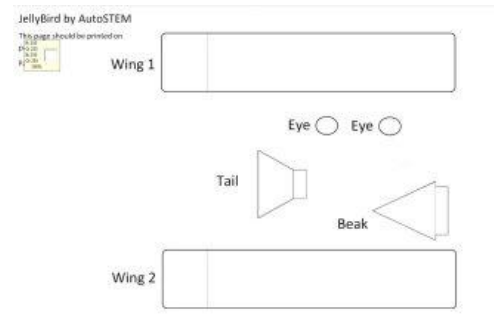


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2. How to construct the jellybird

Parts and tools required

- Standard computer printer capable of printing card up to 220gsm
- A4 standard printing paper (can be coloured paper)
- A4 card (about 220gsm, can be coloured card)
- Scissors
- Gluestick (To stick the parts together, gluesticks are best but Sellotape can be used, but make sure colouring is completed before assembly).
- Food packaging carton (for the carton material)
- Colouring materials (felt tip pens or paints)



Method

It is best to watch the video

<https://www.youtube.com/embed/dipxa-V4fXA> before

starting the construction:

1. Print page 1 on paper
2. Print page 2 on card
3. Cut out all the parts
4. Colour the parts, make sure that the correct sides are coloured.
5. Take the 'Support', place it on Food packaging carton material, and cut around shape. It might be easier to draw around the parts first. Do this twice!
6. Stick the 'Beak' and 'Tail' on 'Body 1'
7. Stick 'Body 1' to 'Body 2' so they fit each other exactly. Do not stick inside the dotted lines as the wings go through the centre. You can use a gluestick or sticky tape.
8. Stick 'Wing 1' to one 'Support' made of carton material from the dotted line on the wing.
9. Stick 'Wing 2' to the other side of the same 'Support'. Again use the dotted line on the wing as the guide.
10. Stick the other 'Support' made of carton material to the side of 'Body 2'. The top of the support in line with the dotted line.
11. Stick the 'Eyes' on either side at the round end.
12. Push the 'Support' that carries the wings through the narrow space between the 2 'Body' parts, so that the top of the support is in line with the top of the body. The wings should be above the body.
13. Bend the wings on either side of the body.
14. You are now ready to fly. Holding the fixed 'Support', move the loose 'Support' (with the wings) up and down. You are flying.

Automata for STEM

web: <https://www.autostem.info/autostem>

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