



DATA SCIENCE WITH LEGO

Build: Spin to Win

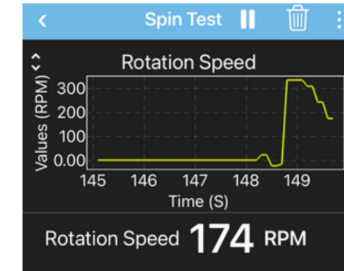
Learn:

Rotation Speed: Rotation speed indicates how fast an object rotates.

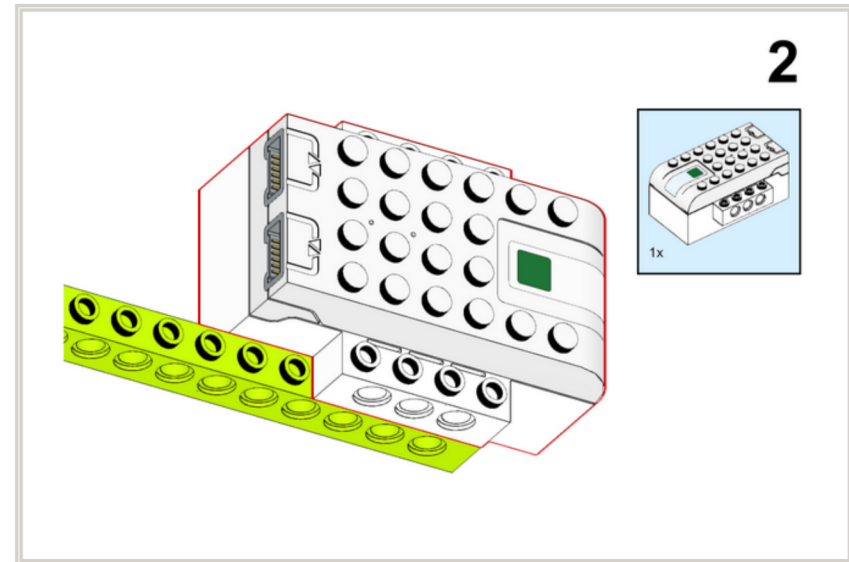
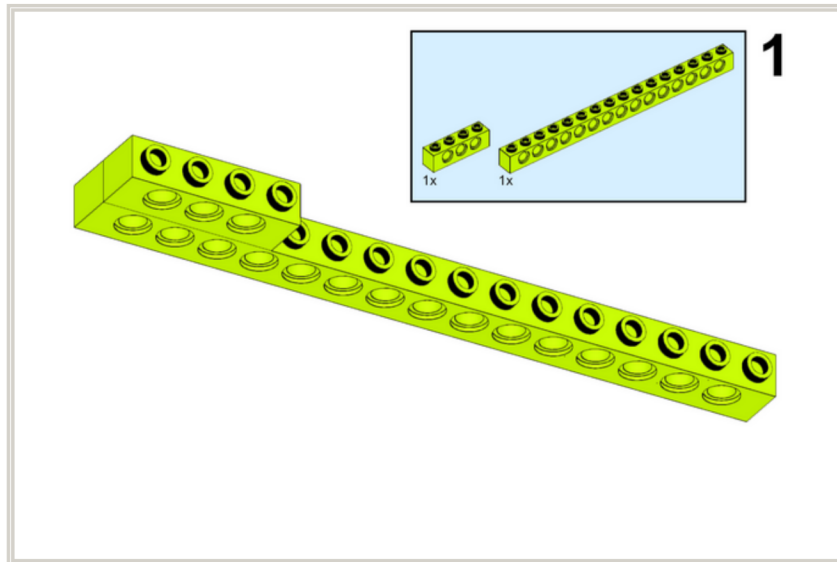
Revolutions Per Minute (RPM): A unit of measurement that describes how fast an object is turning.

Gyroscope: A sensor that measures rotation speed.

Create this marvelous machine to explore **rotation speed** using databot's **gyroscope**. Use your skills to change direction and increase or decrease the speed. Measure your changes in **revolutions per minute (RPM)**!



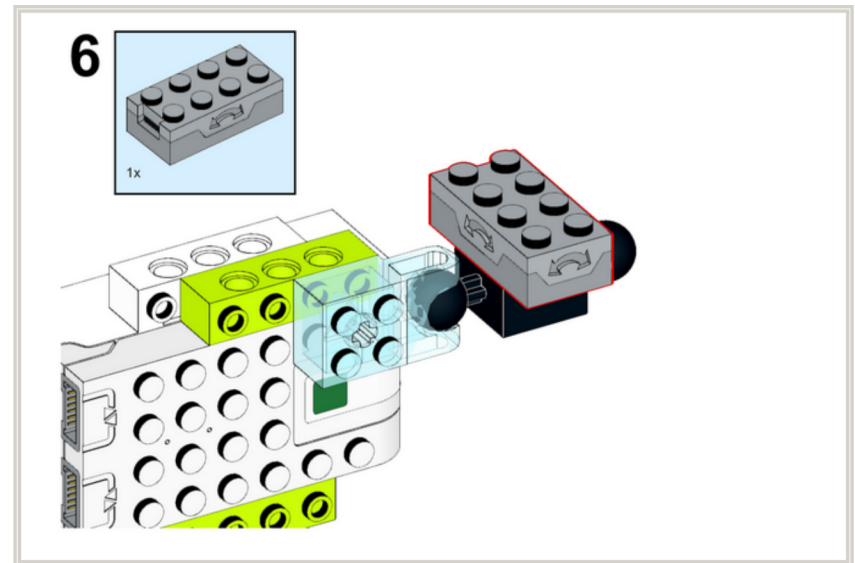
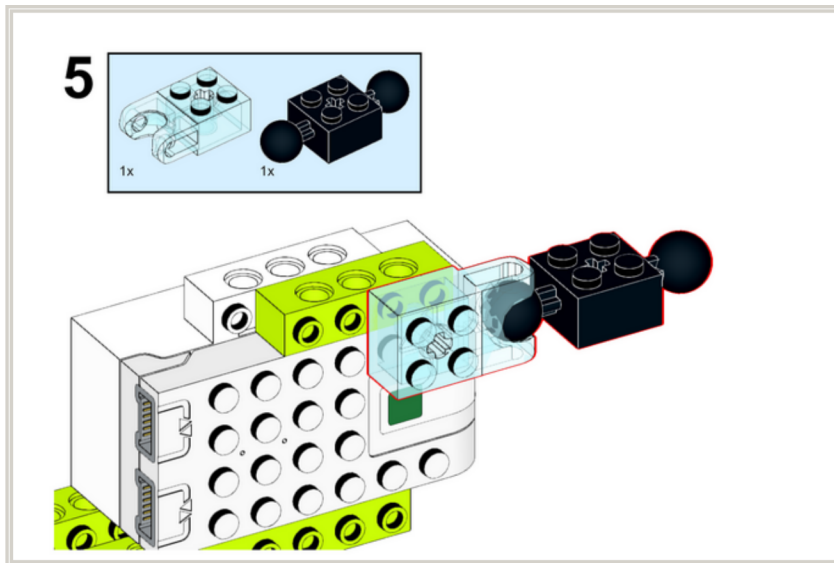
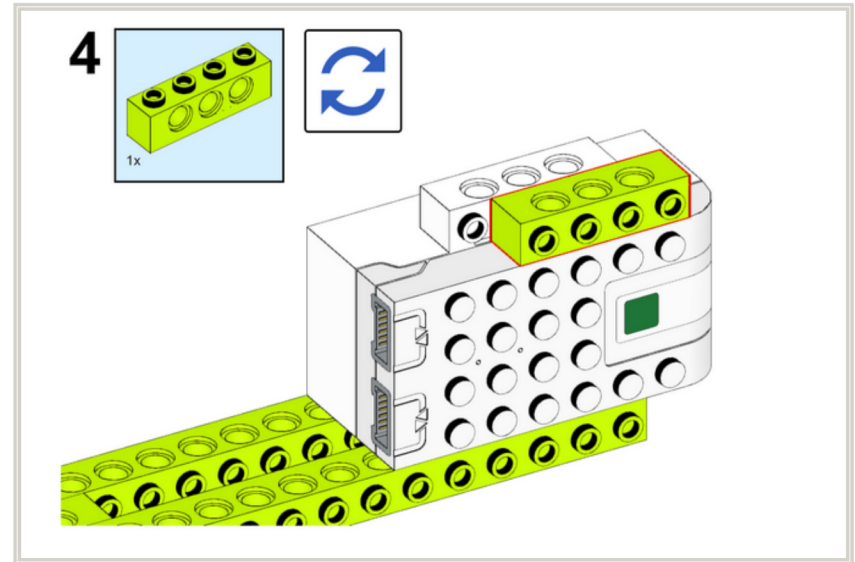
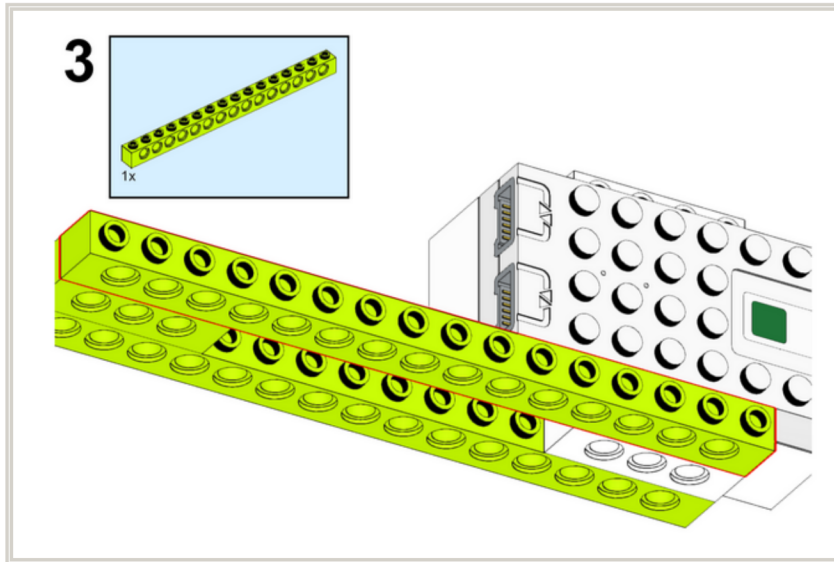
Identify your top **RPM** using **graphs** and **analysis**.





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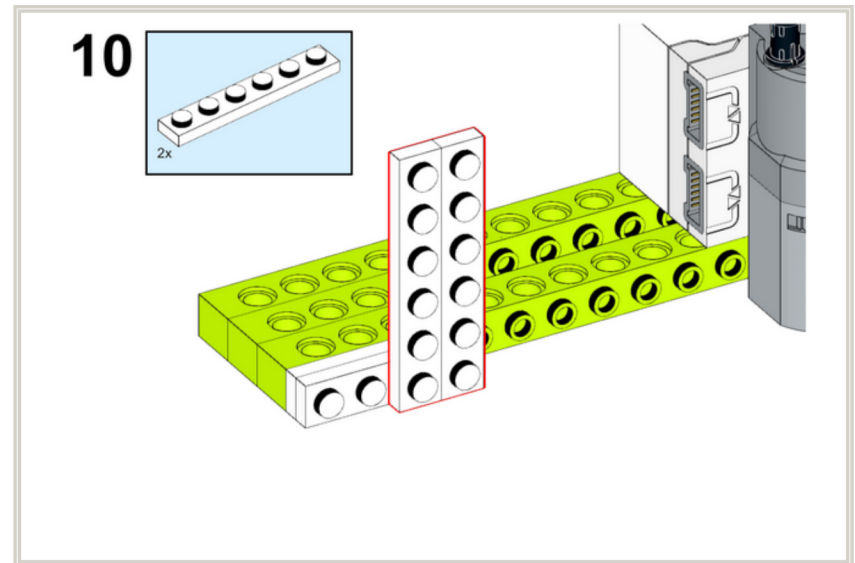
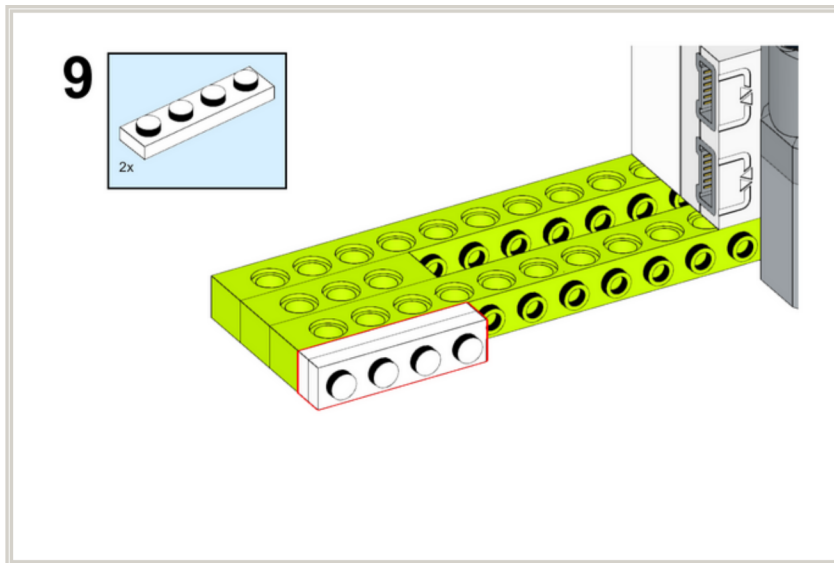
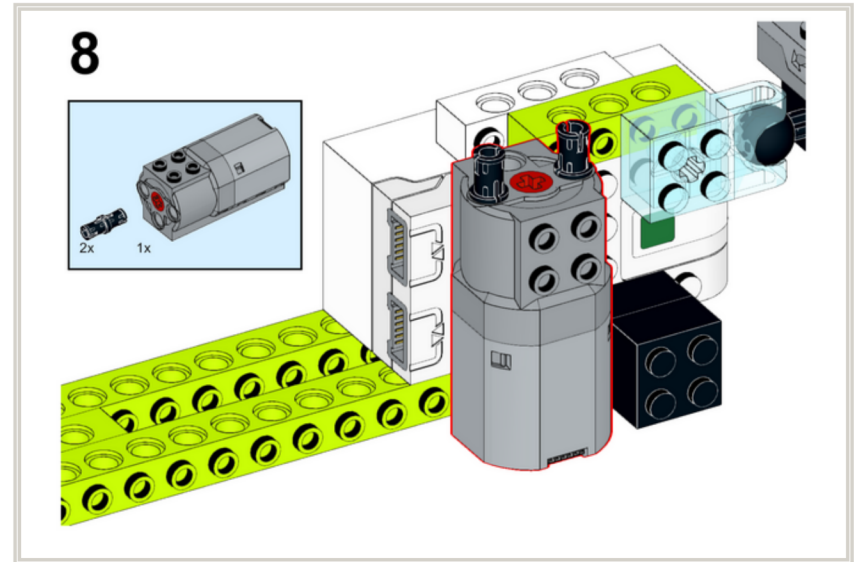
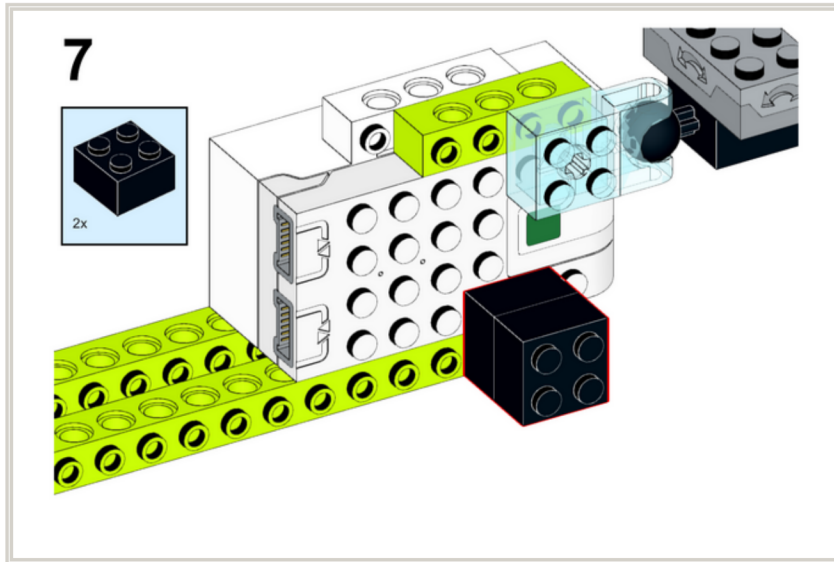
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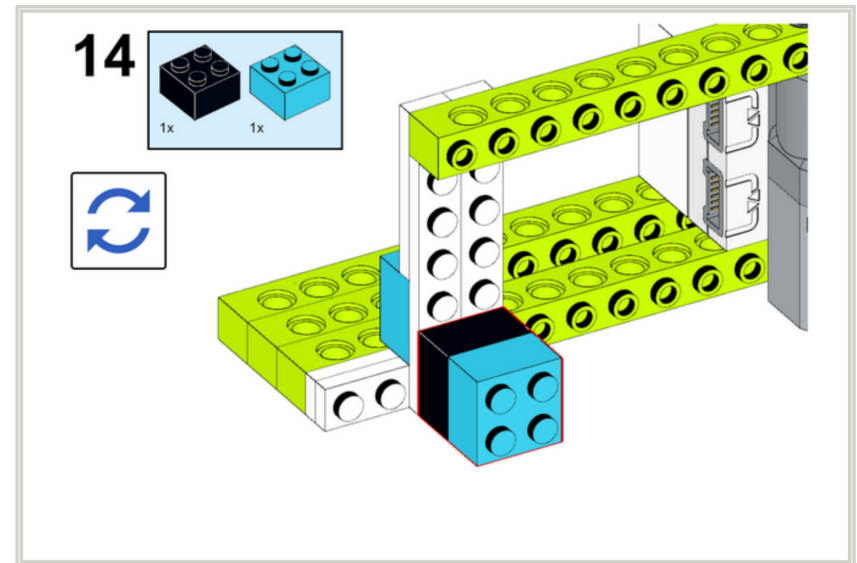
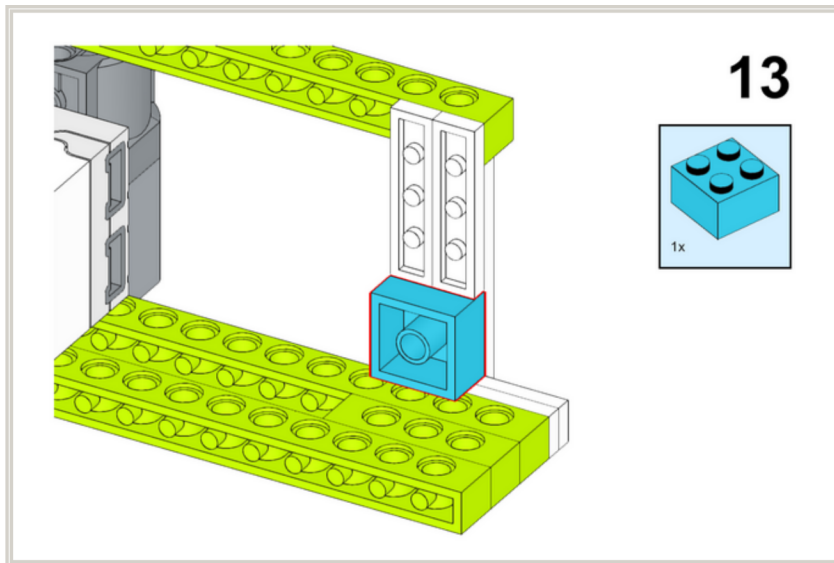
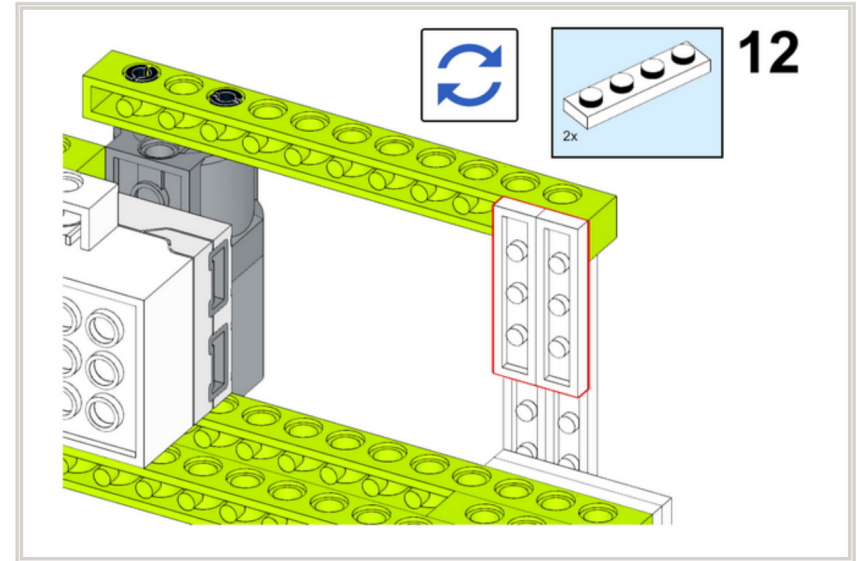
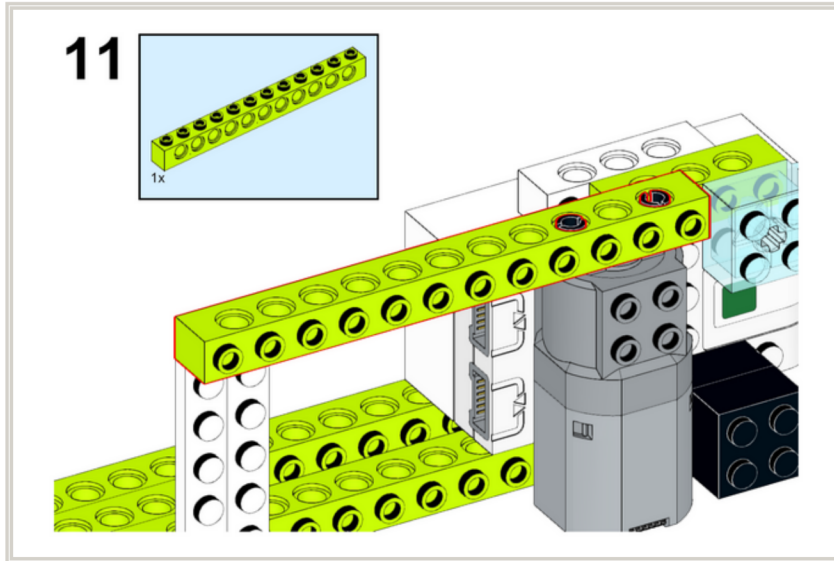
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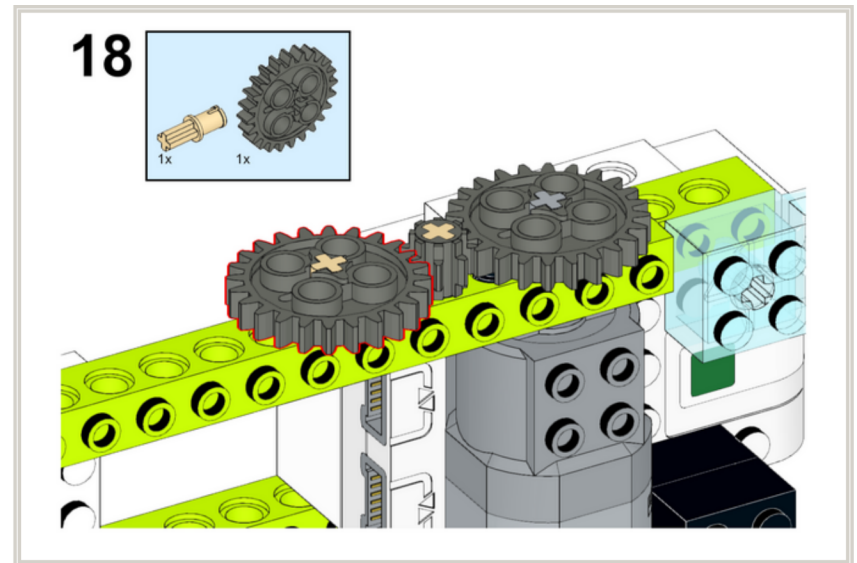
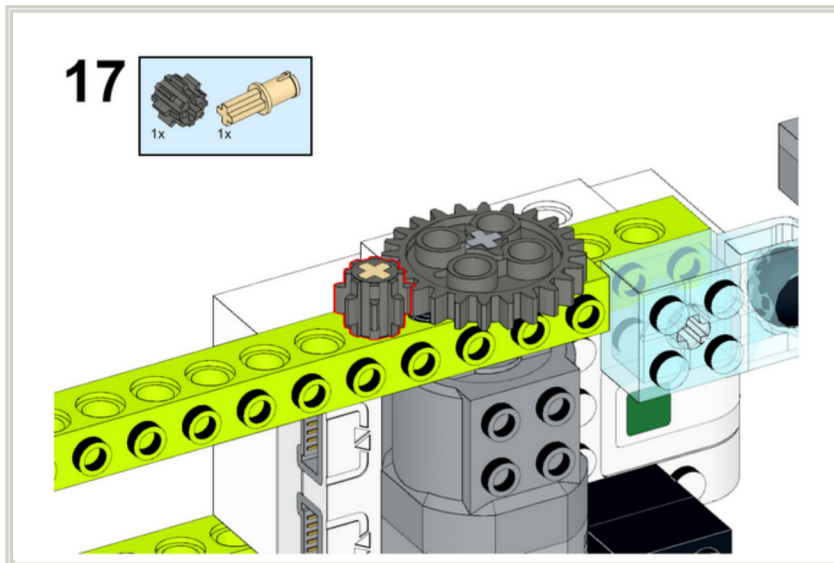
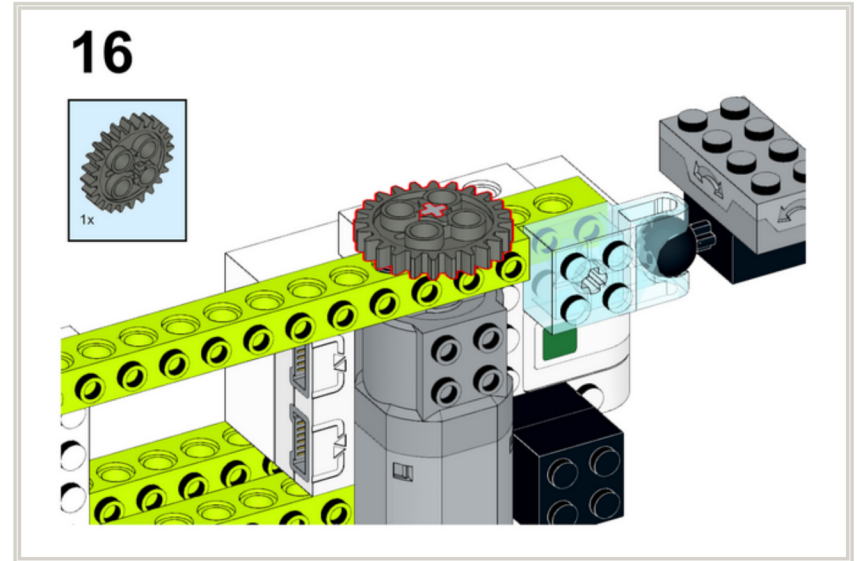
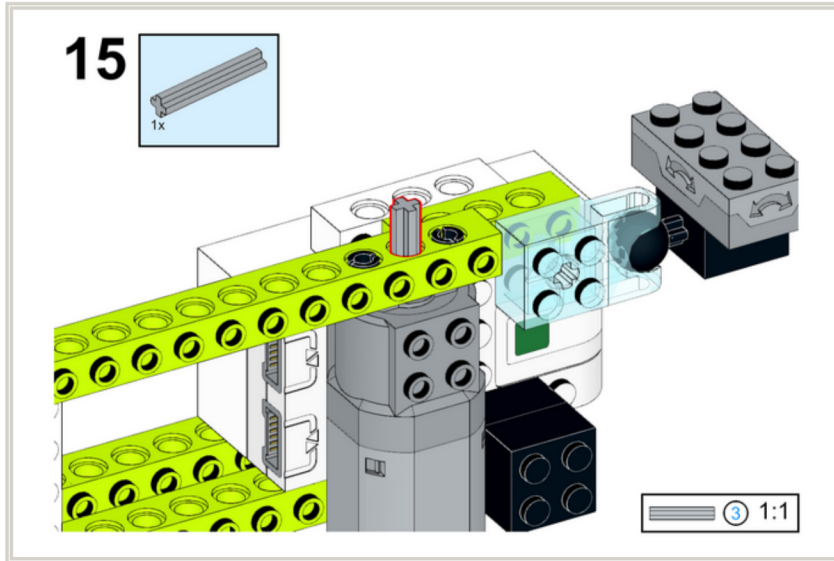
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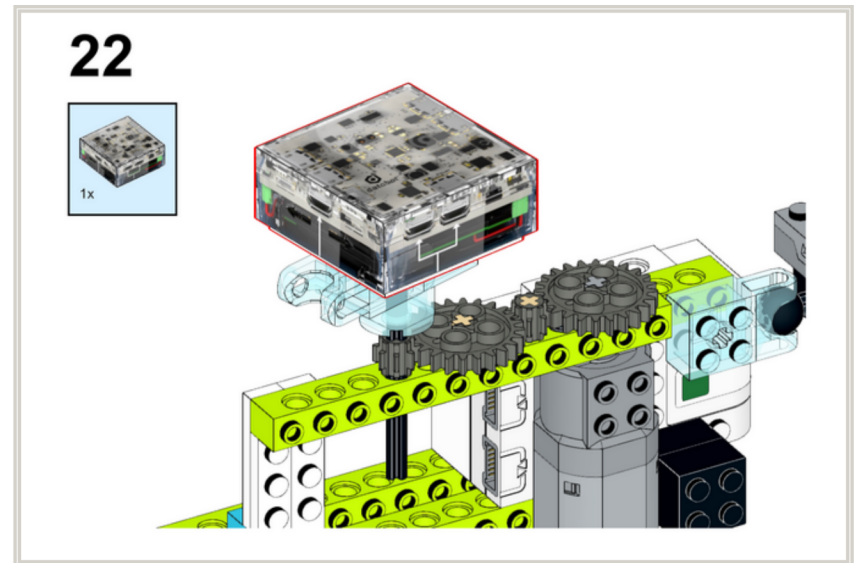
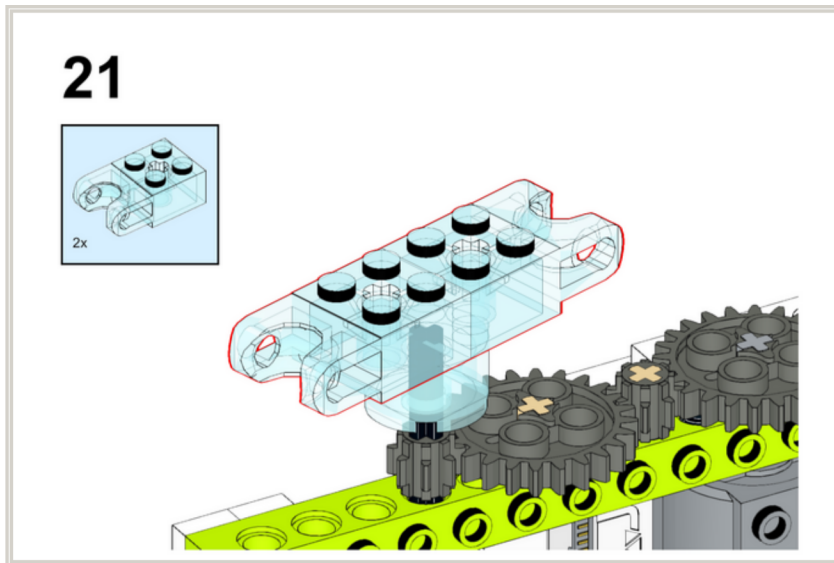
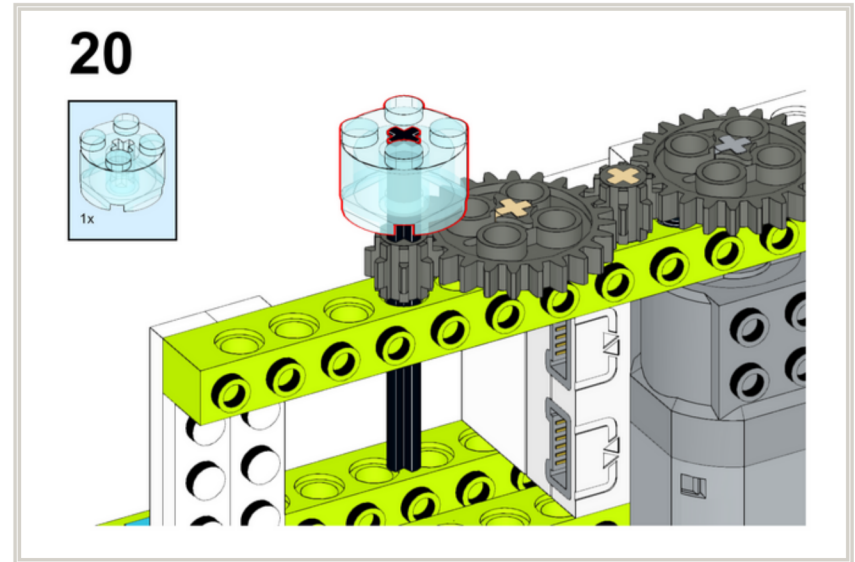
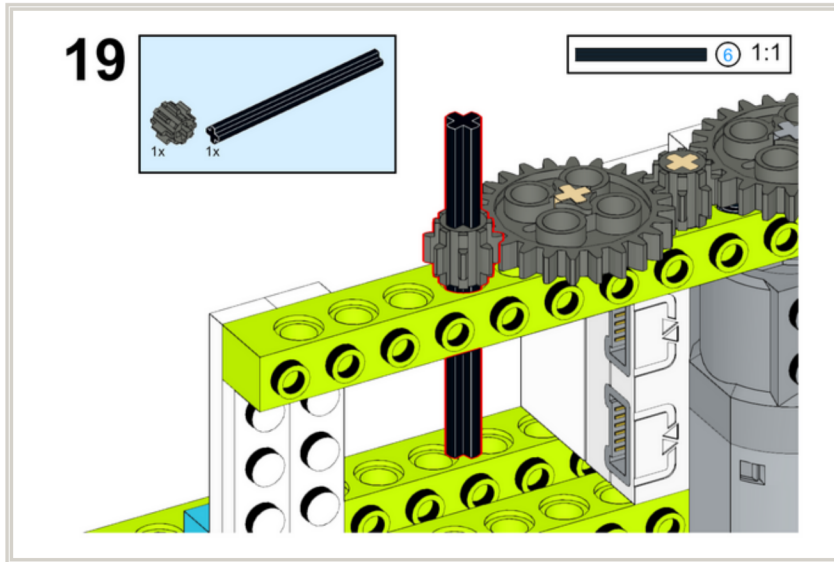
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Build: Spin to Win





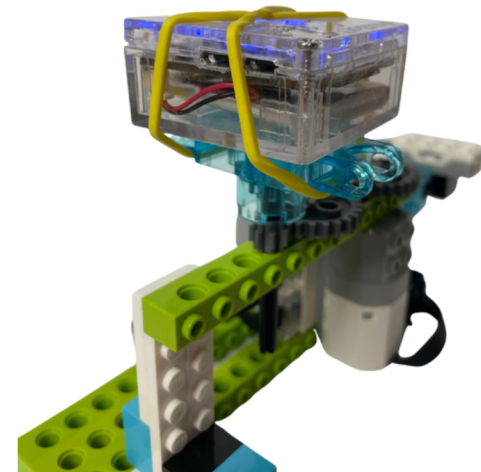
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Final Steps: Attach databot!

Attach databot to your build so you can measure your **rotation speed** using the databot **gyroscope**.

Attachment Method One: Rubber band databot to the mount attached in Step 21.

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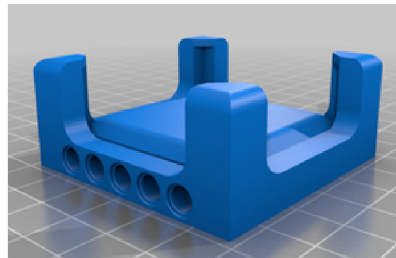




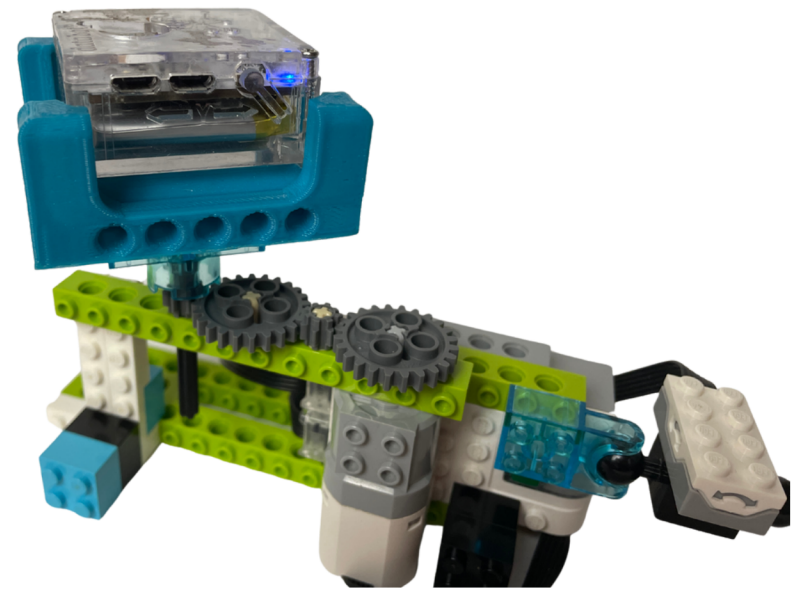
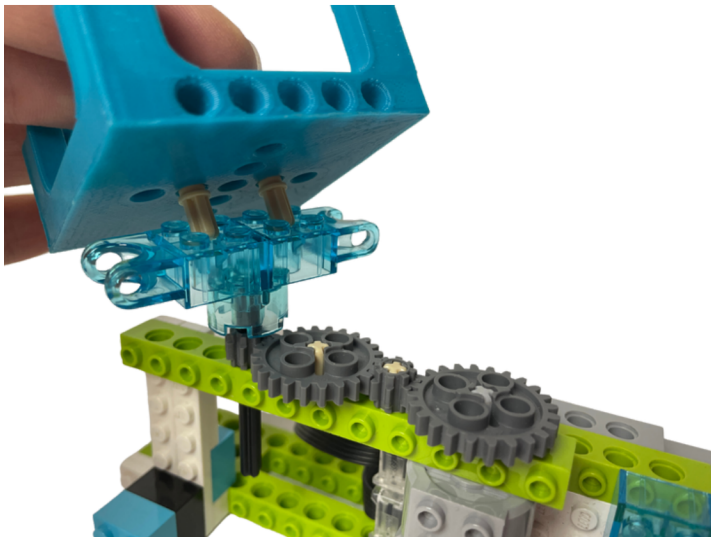
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Attachment Method Two: Use a 3D printer to print the supplied databot mount. Get the file for printing here:



<https://www.thingiverse.com/thing:6223612/files>





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Data Science: Spin Test

Data Time!

Now explore your machine's **rotation speed** using databot's **gyroscope**. Change your power level or modify the machine to change the direction of spin and speed. Measure your changes in **revolutions per minute (RPM)**!

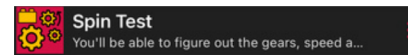
Preparation: Spin Test



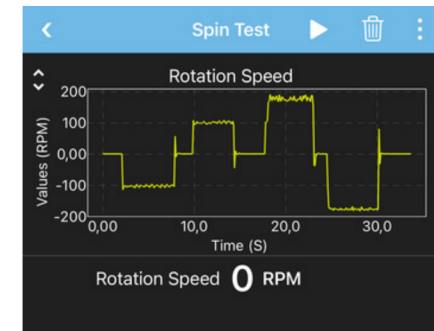
Load the Vizeey App



Scan the "Spin Test" QR code using Vizeey



Tap on Spin Test, Connect to databot.

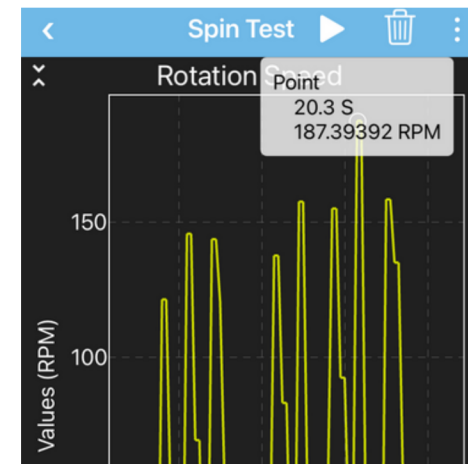


Run the experiment & turn on your model!

The Spin Test experiment displays the **rotation speed** of databot as it spins on your build. You will collect data using Vizeey and databot and identify **rotation speed** in **revolutions per minute (RPM)**.

Statistical Investigative Question: Can you change the **rotation speed** by changing your gear size or configuration?

What is your prediction?



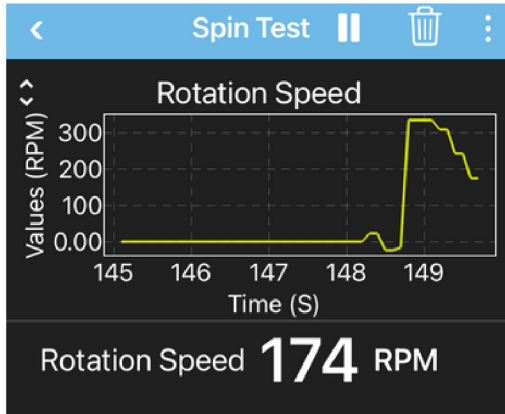


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Data Science: Spin Test

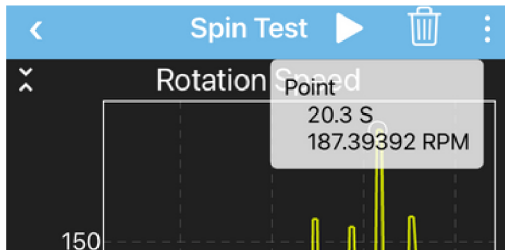
Exploring Your Data

Graphing

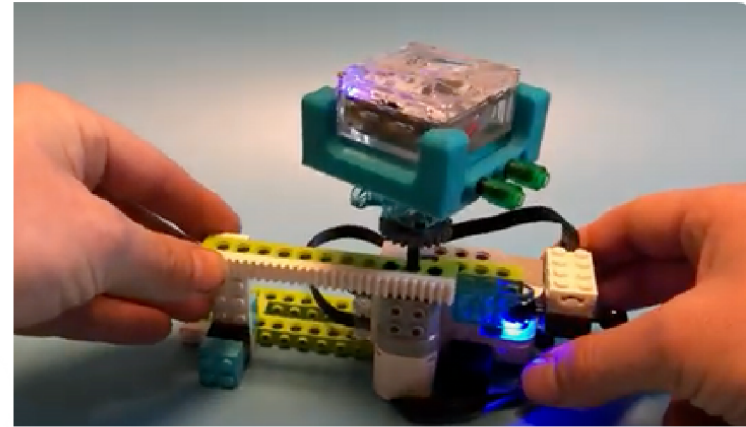


Experiment with **Rotation Speed** by adjusting power and modifying your machine.

Analysis



Tap on your data graph and use Pan, Zoom, Pick Data to identify your highest **rotation speed**.



Watch the video, experiment, and answer the questions : <https://youtu.be/cKJE7XqAgrM?si=RzFIkxNixwZoseK7>

Questions

- Can you change the **rotation speed** by changing gears?
- Was your prediction correct?
- What is the highest **RPM** you recorded?
- What was the lowest consistent **RPM** you recorded?
- Can you change the direction of rotation using gears?
- How can you tell the direction of rotation from your data?

If you are now a master of **rotation speed** it's time to play Spin to Win! Good luck data scientist!



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Data Science: Spin to Win

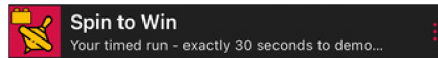
Preparation: Spin to Win



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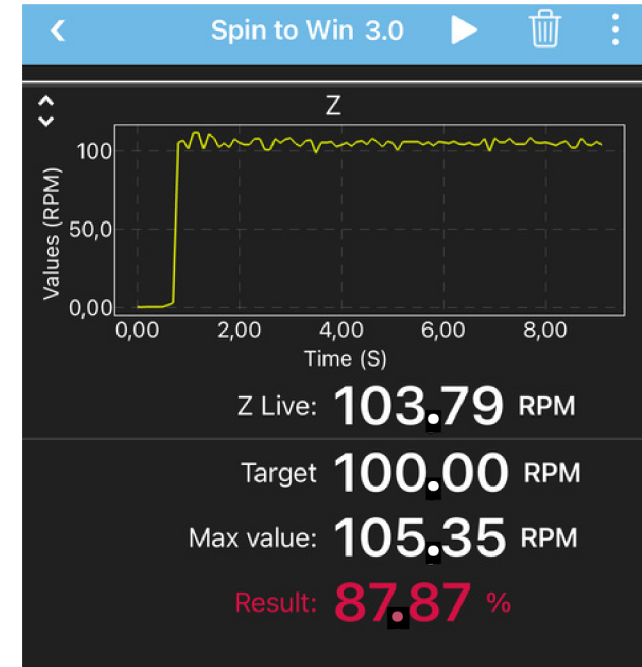
Tap on Spin to Win, Connect to databot.

Challenge: Spin to Win!

You are now challenged to demonstrate your mastery of data science and engineering in a game of skill and wits! Spin to Win challenges you to use your knowledge to achieve a perfect **rotation speed** of 100 **revolutions per minute (RPM)**. Your accuracy is measured by the databot **gyroscope**.

Spin to Win

- Refine your **rotation speed** by changing gear sizes or motor settings.
- Use the Spin Test experiment to practice and achieve a perfect 100 **RPM**.
- With your machine running at 100 **RPM**, start Spin to Win.
- It will give you a three second countdown then capture a 10 second data set. Good luck!



Can you score a perfect 100 **RPM** and 100%?!