Create it REAL

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Getting started with 3D Printing

Anders Bod Lund – Create it REAL

2017-1-DE03-KA201-035615

We are the Makers

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Agenda:

- The 3D printing process
- Terminology
- CAD Modelling
- What we have done locally
- Tour of the school
- Slicing softwares
- How to make a great project

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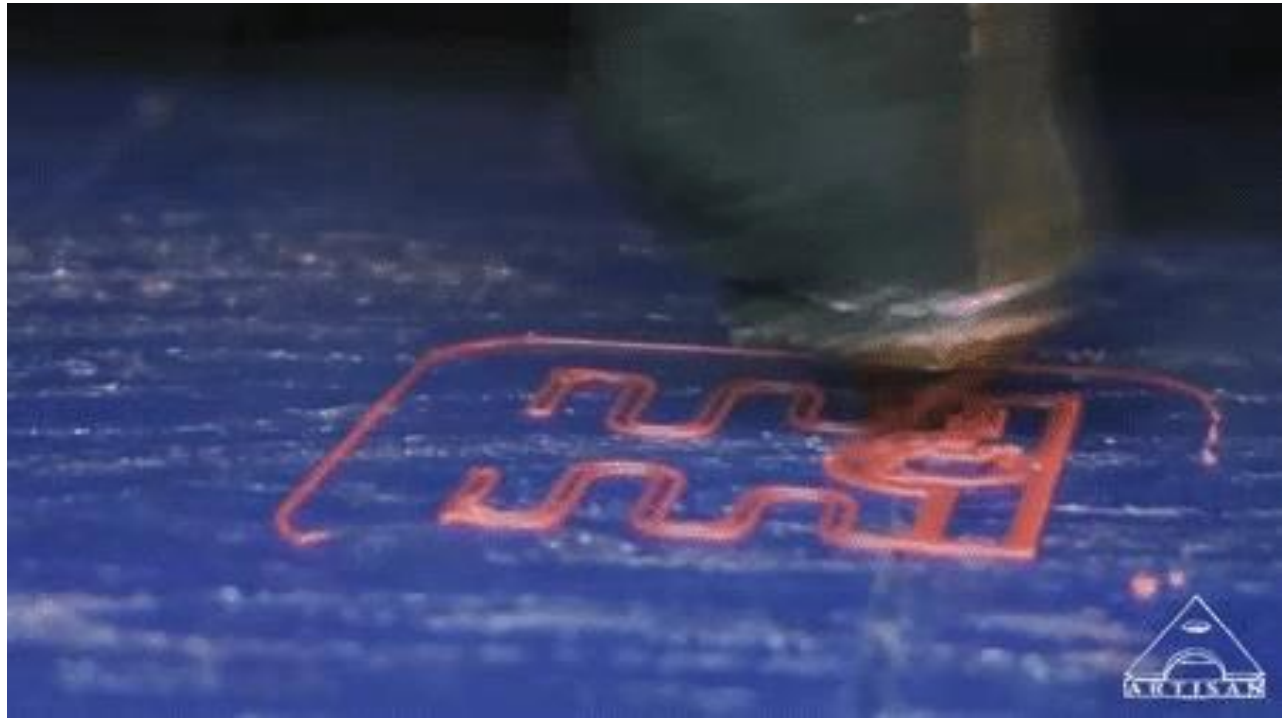
3D printing

- Digital Fabrication
- Additive manufacturing
- FDM/FFF 3D printing



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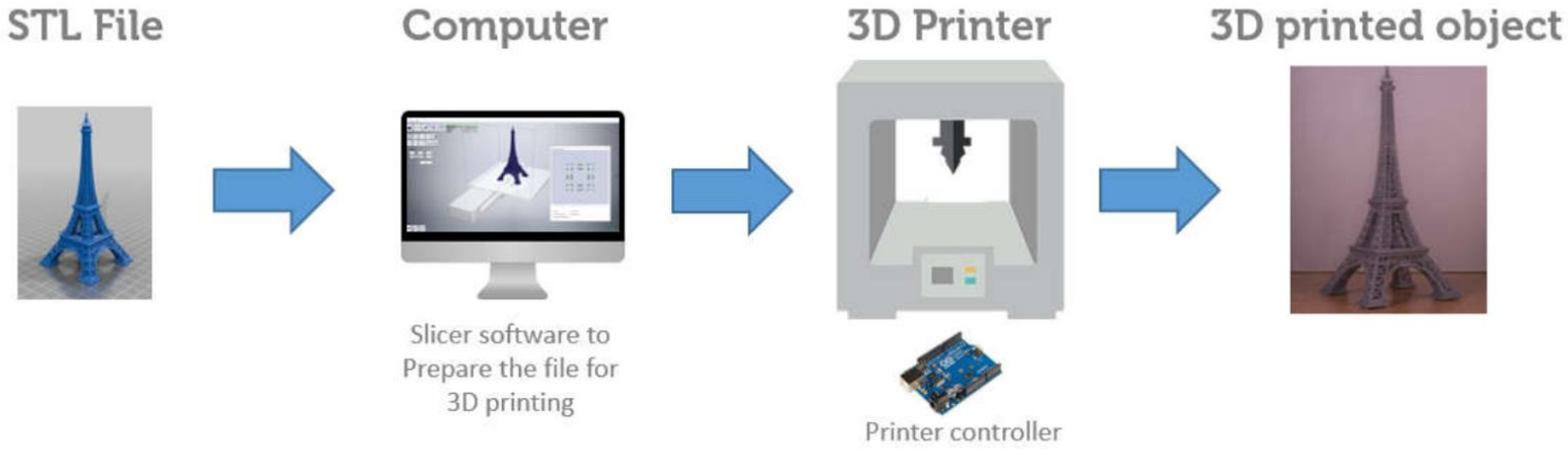
Create it REAL

- R&D company for 3D printing
- Specialising in speed and security
- Partners



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3D printing

- 15 printers in 8 schools
- Teachers
- STEM/STEAM
- Create it REAL's role
  - Feedback from teachers
  - Developed features for the educational fields

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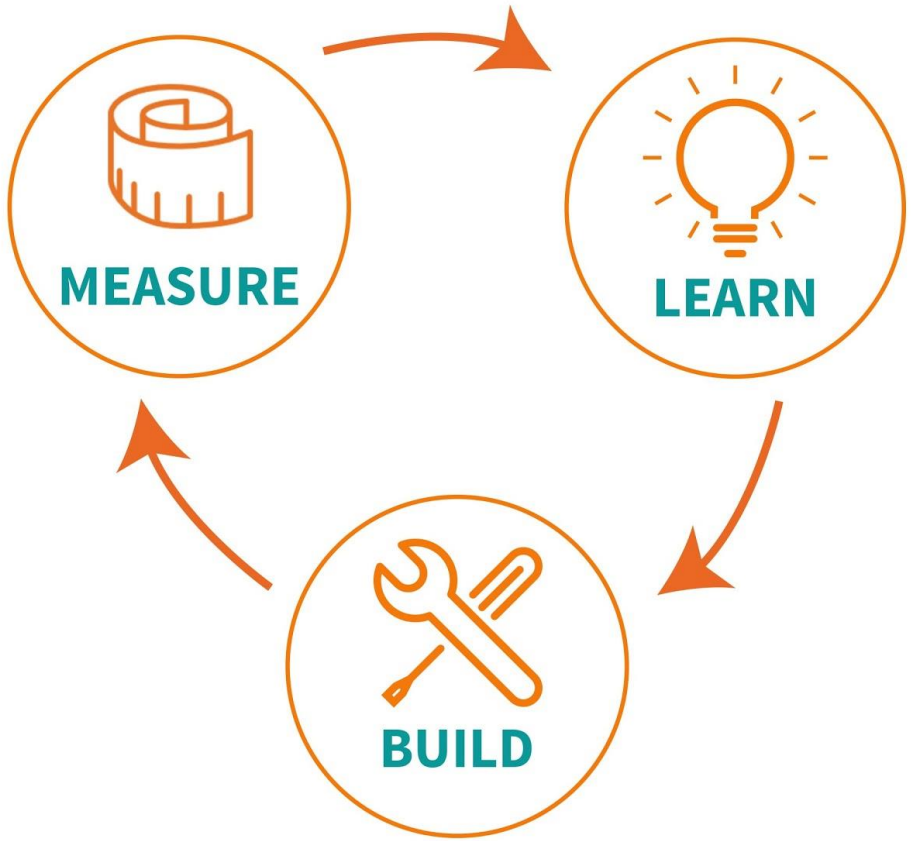
3D print mindset

- Fail Faster
- Lean Startup
- Seymore Papert – Constructionism
- Innovation



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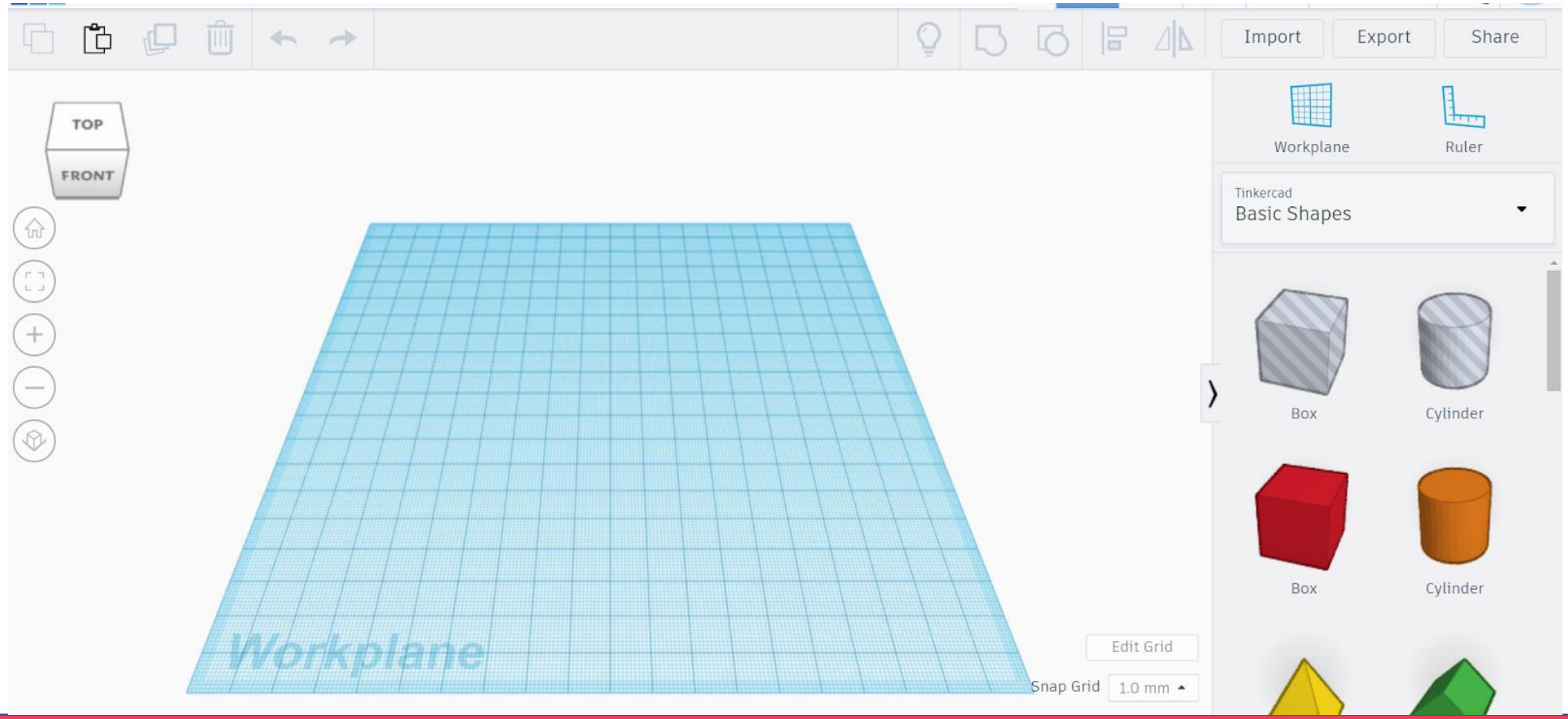
Design challenge 1 - Make a name-tag P. 5



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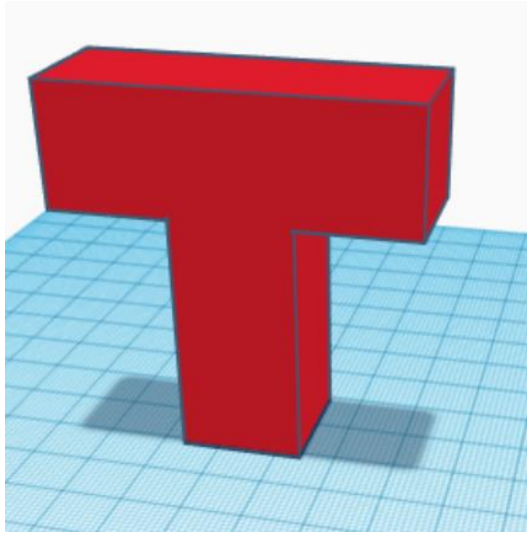
Overhangs

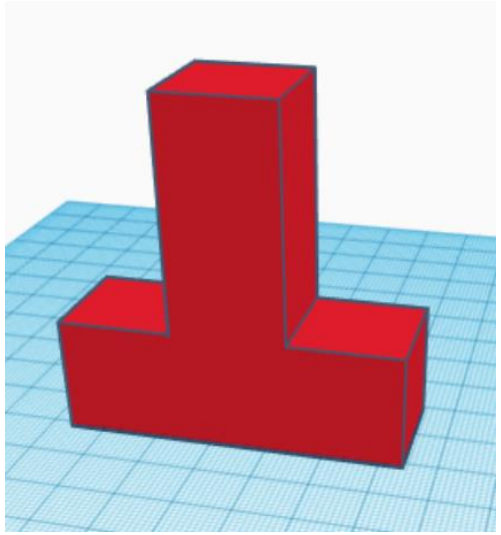
Desired model



Rotation:

Pros: Easy Quick

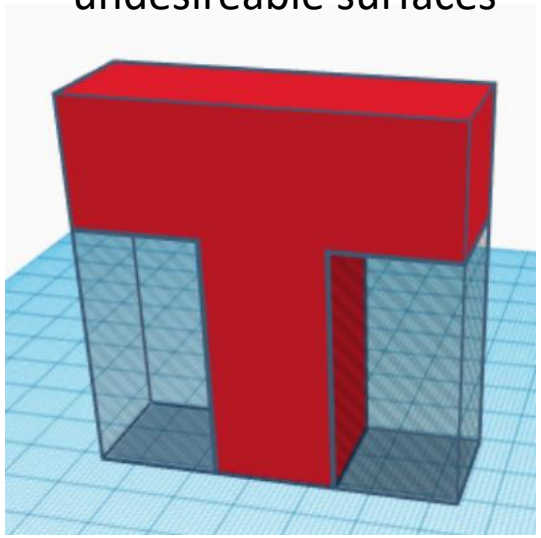
Cons: Not always possible



Support:

Pros: Makes most overhangs printable

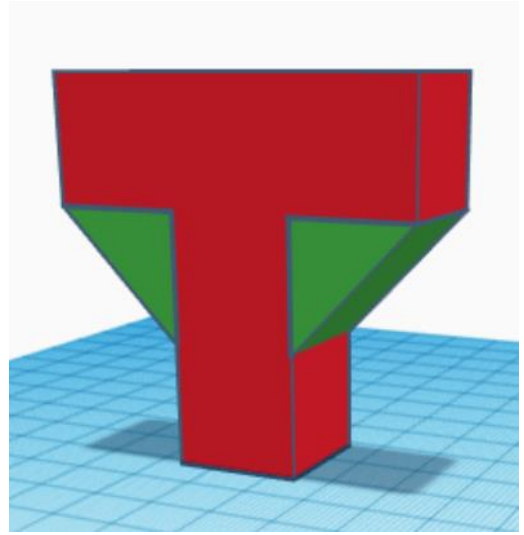
Cons: Wastes materials, undesireable surfaces



Smart design:

Pros: Learning to design for production method

Cons: Takes time and skill



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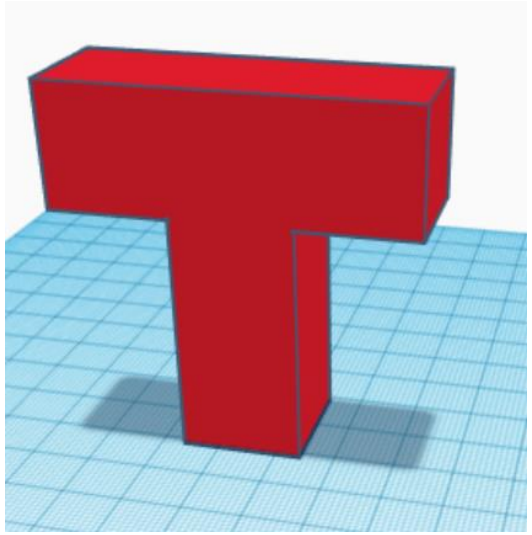

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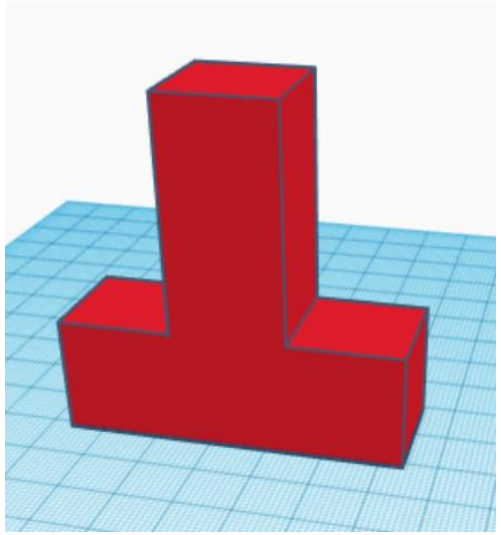

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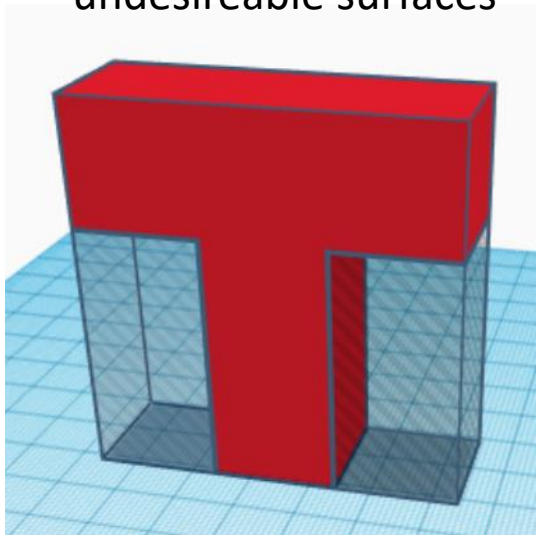

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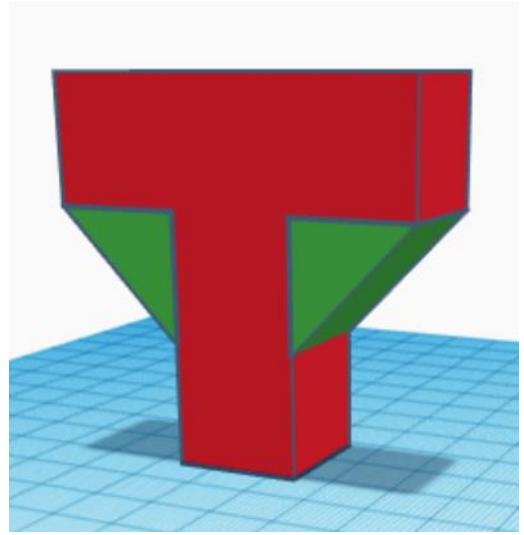

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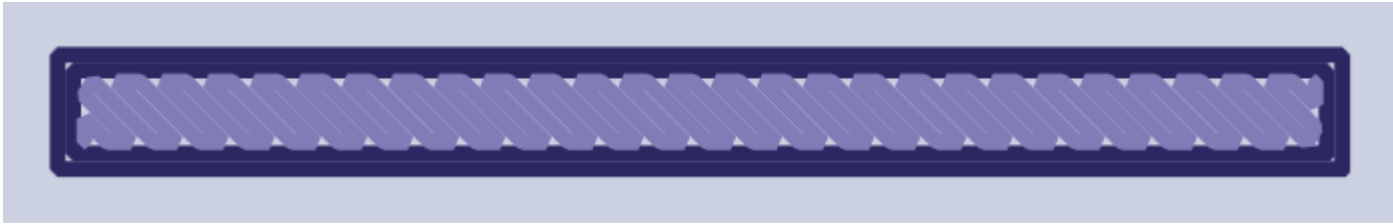
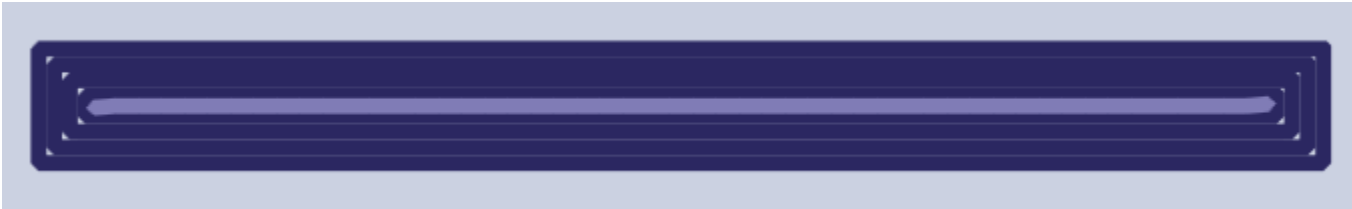
Shell

1mm shell, or 2 contours



2mm shell, or 4 contours



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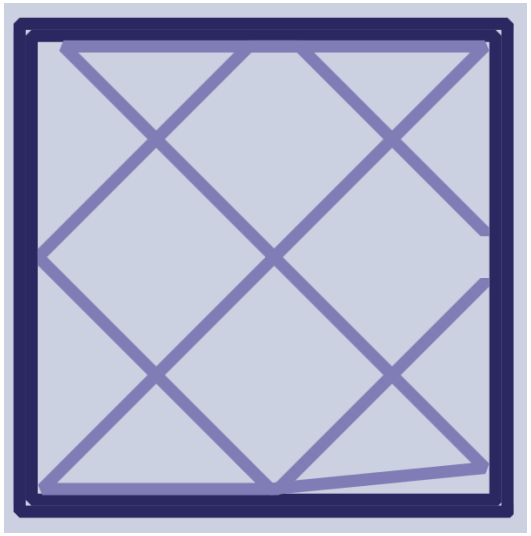
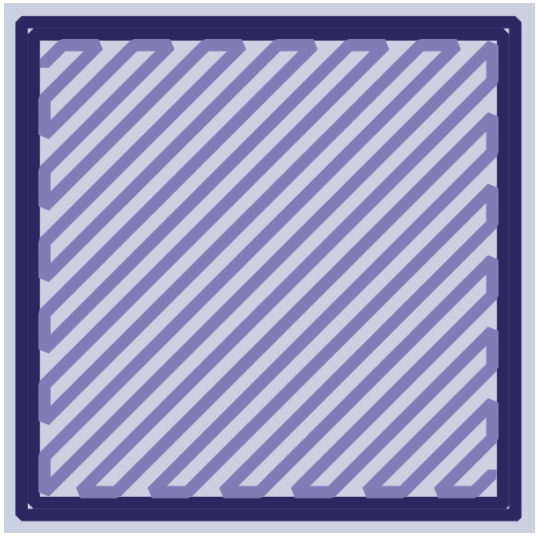
Infill

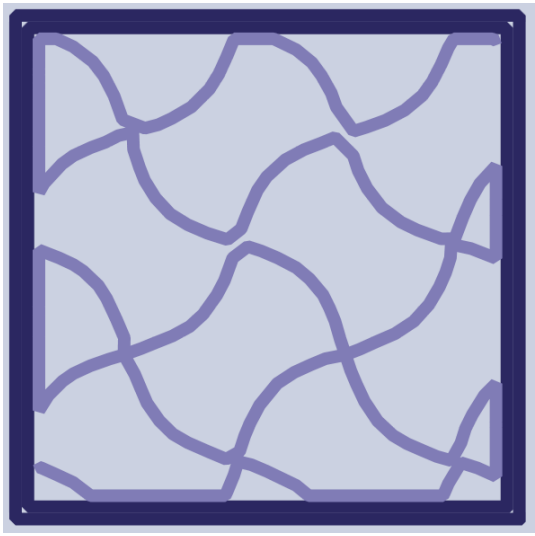
Square infill 15%



Square infill 50%



3D Gyroid 15%



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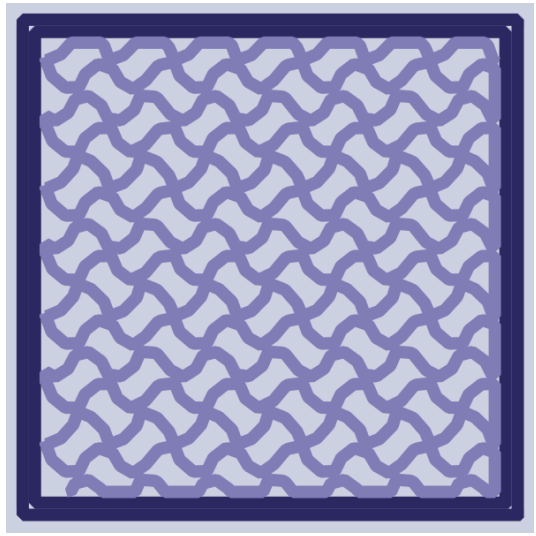

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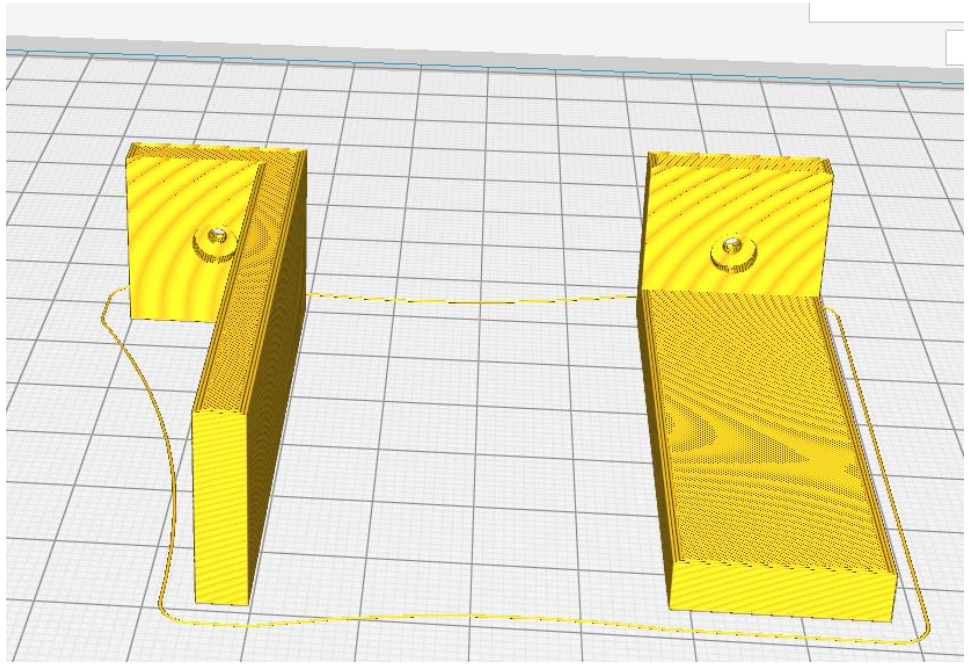
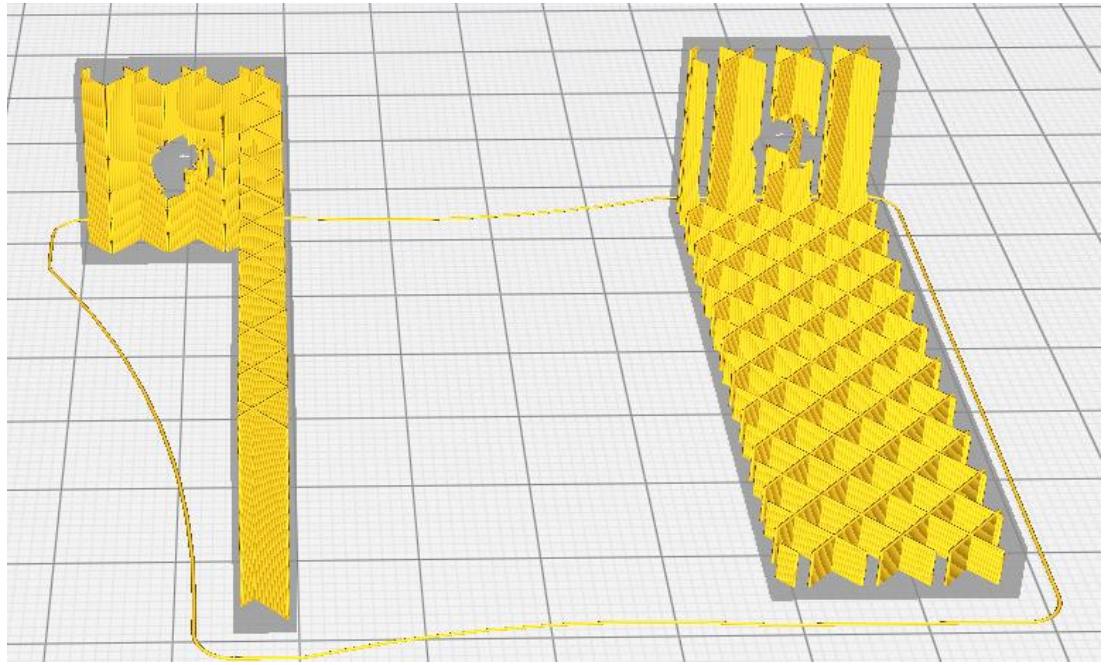
Orientation

The only difference is the orientation. Which matters most for the strength, infill or contours?





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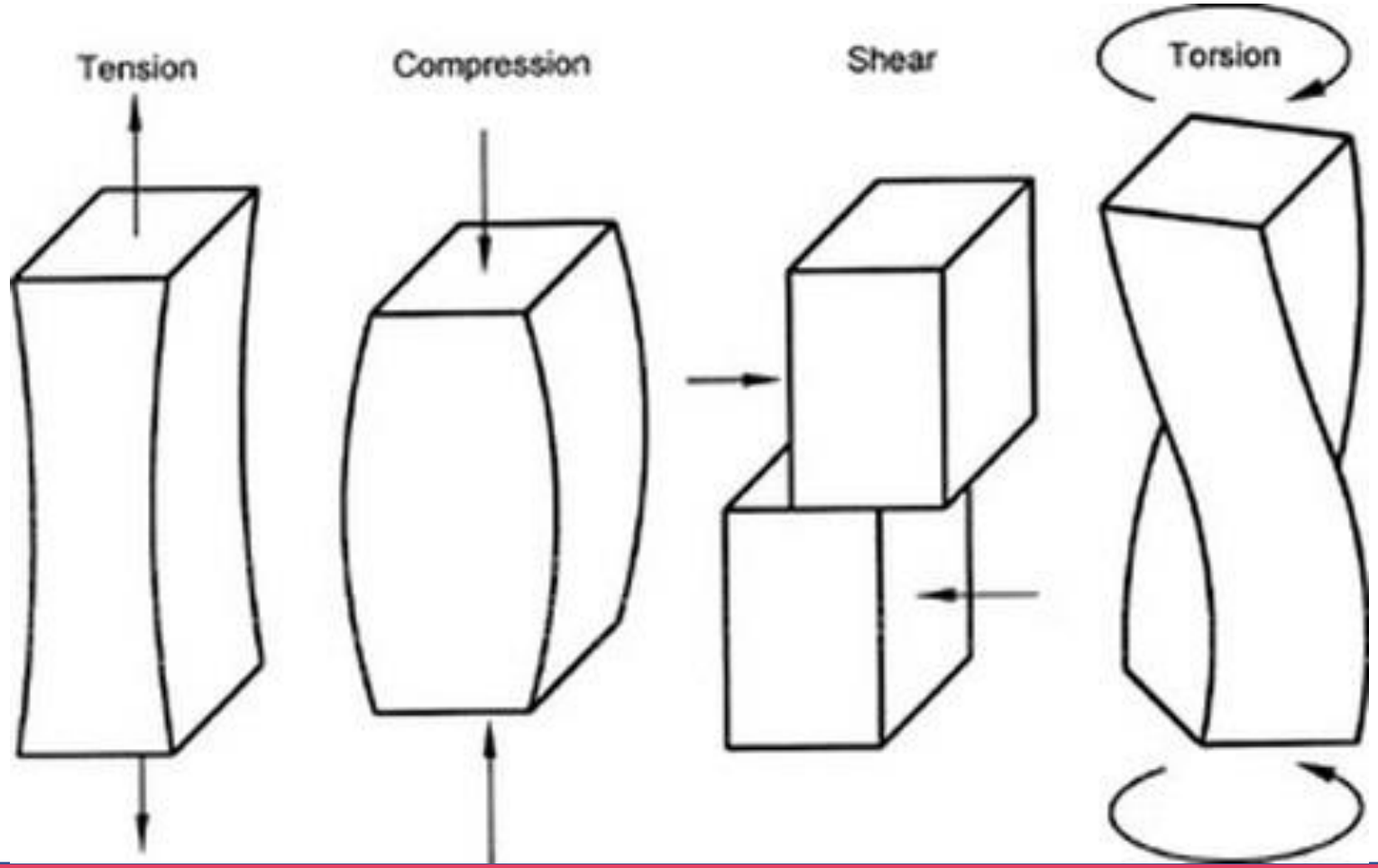
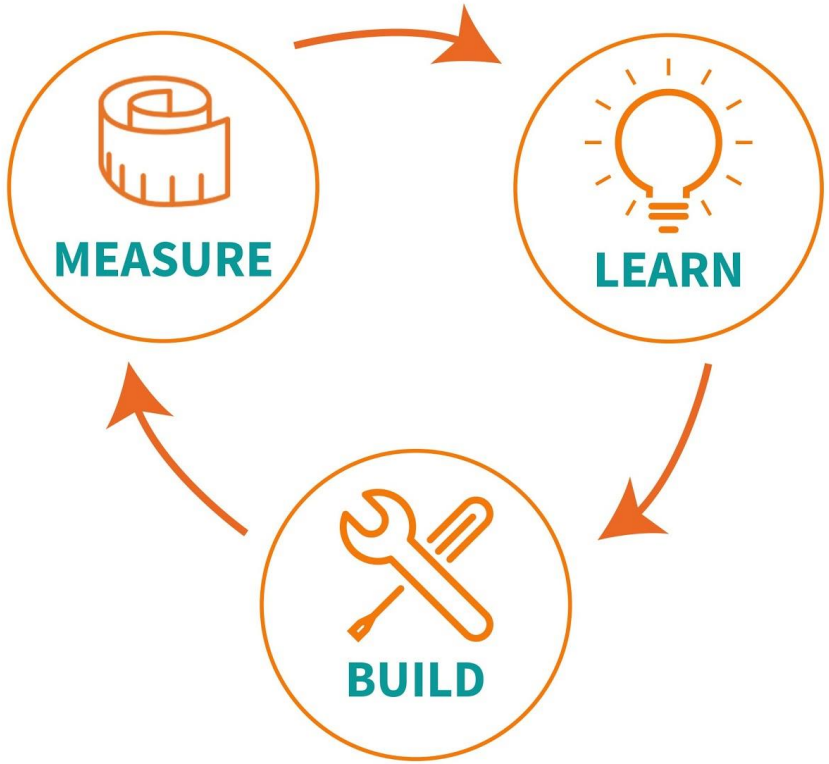
Drawing challenge - anisotropic strength p. 18



Design challenge 2 - Make a bridge p.19

- Bridge must be in scale 1:500
- Bridge must accommodate 2 cars on top and 4 trucks underneath
- The **Strength** of the bridge will be tested
- The **Material Cost** of the bridge will be calculated



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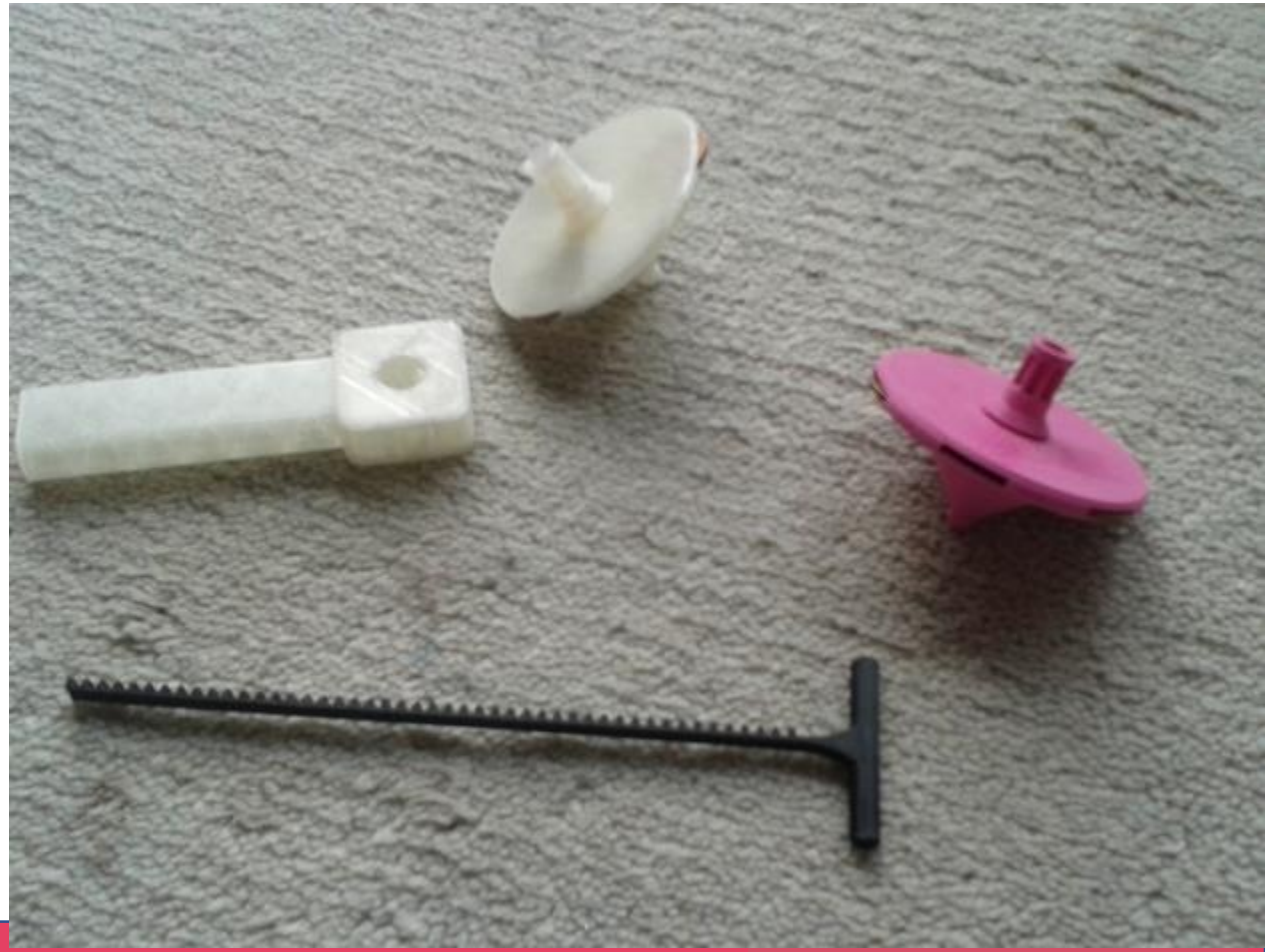
Oresmian Coordinate System

What a child might say:

- The more weight on the edge of the disc, the more stable it spins
- The lower the spinning top is the more stable it spins
- If the spinning top is pointier at the bottom, it spins better



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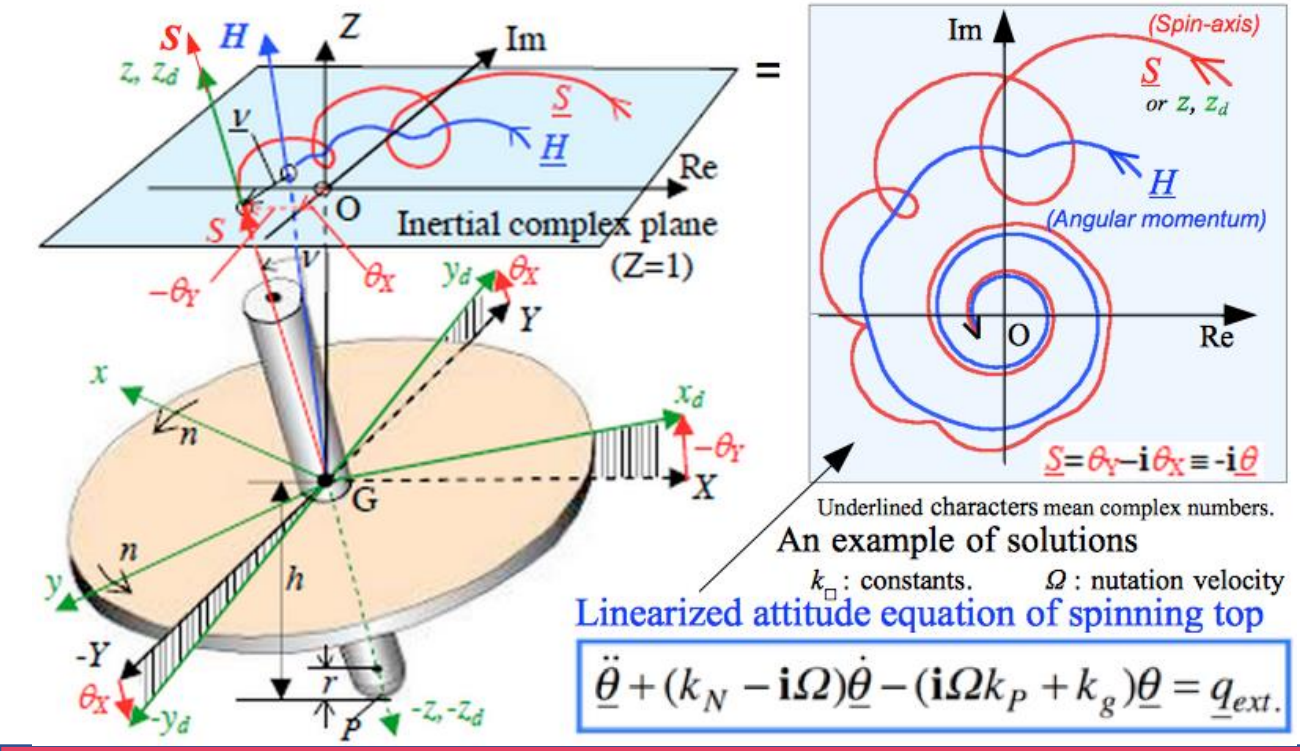
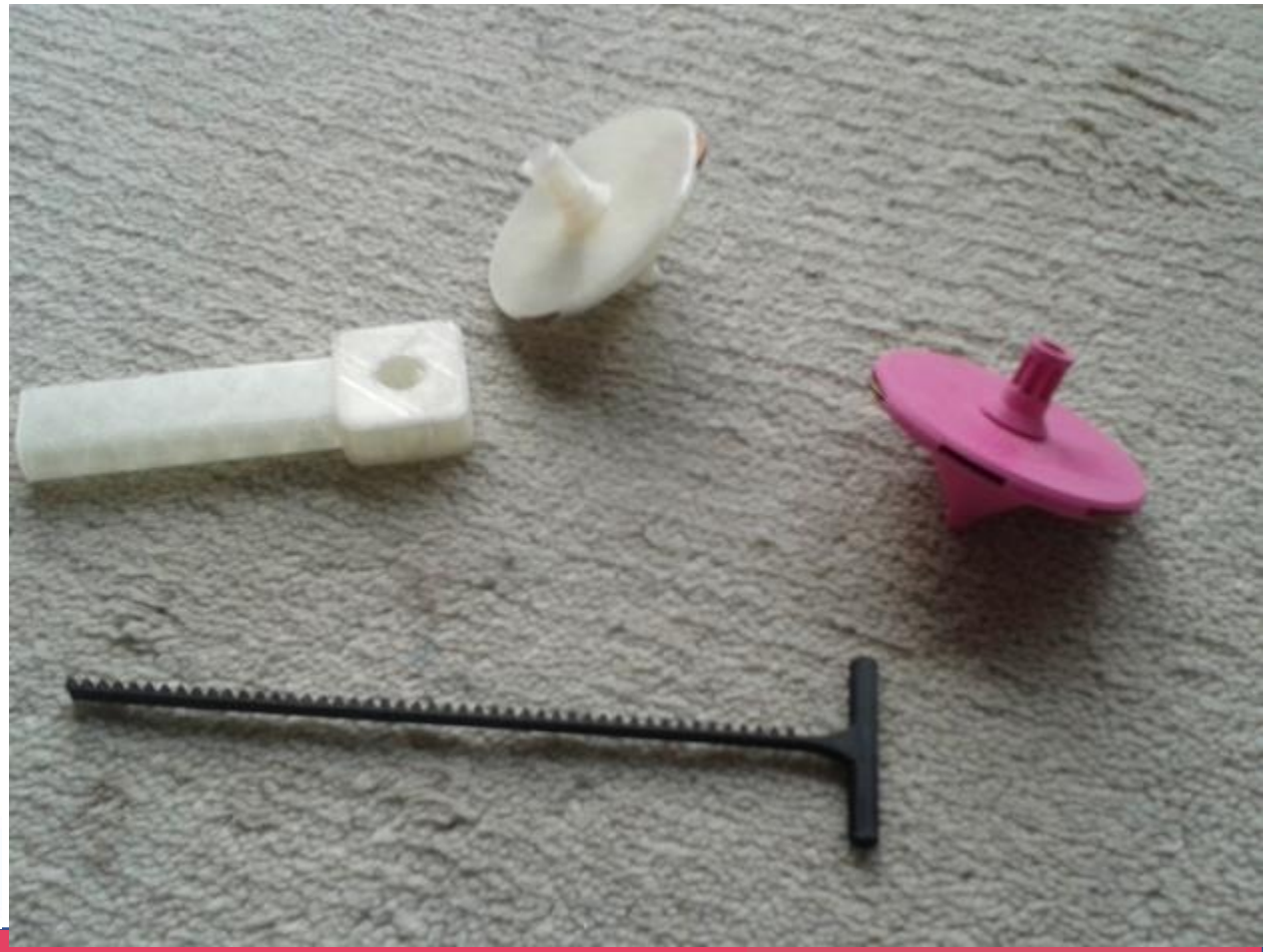
Oresmian Coordinate System: Spinning tops

What a child is learning about:





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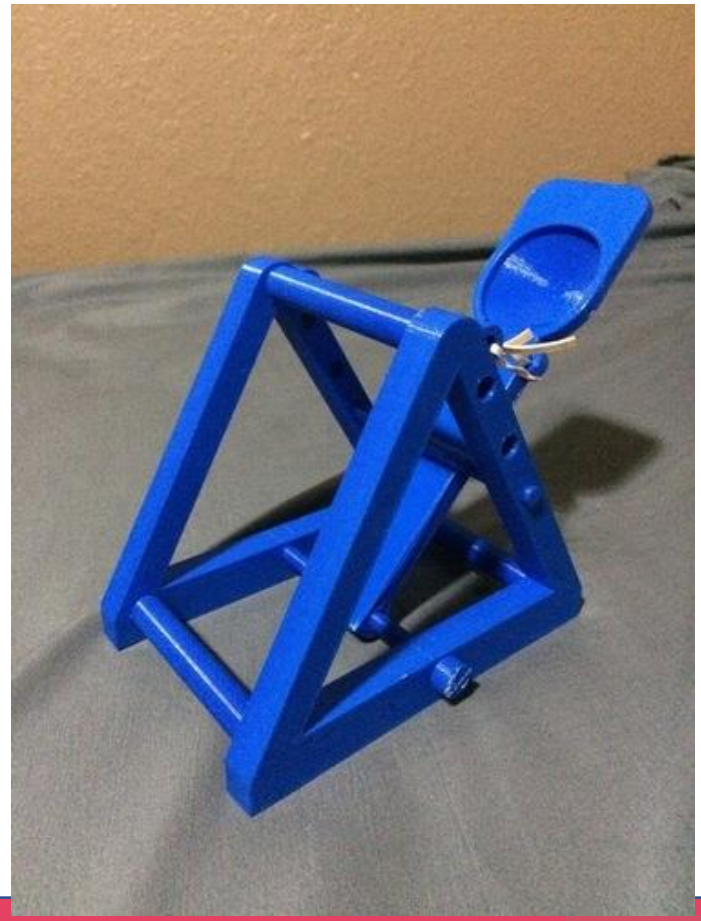
Oresmian Coordinate System

What a child might say:

- The catapult will throw the object the longest, if it releases the projectile at 45 degrees
- The longer the arm, the longer the projectile will shoot.



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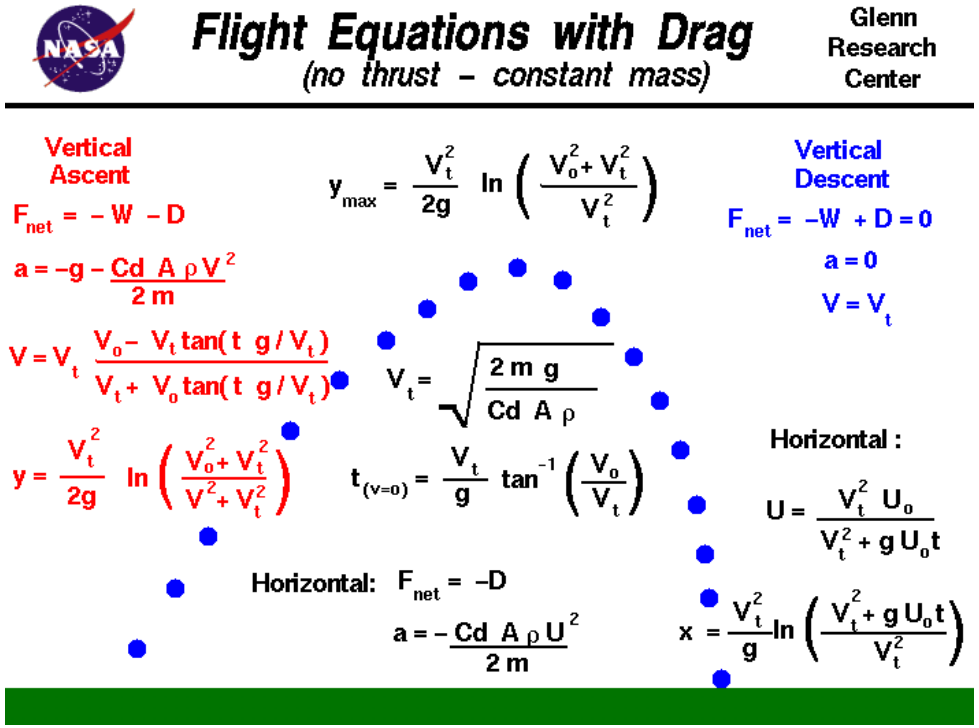

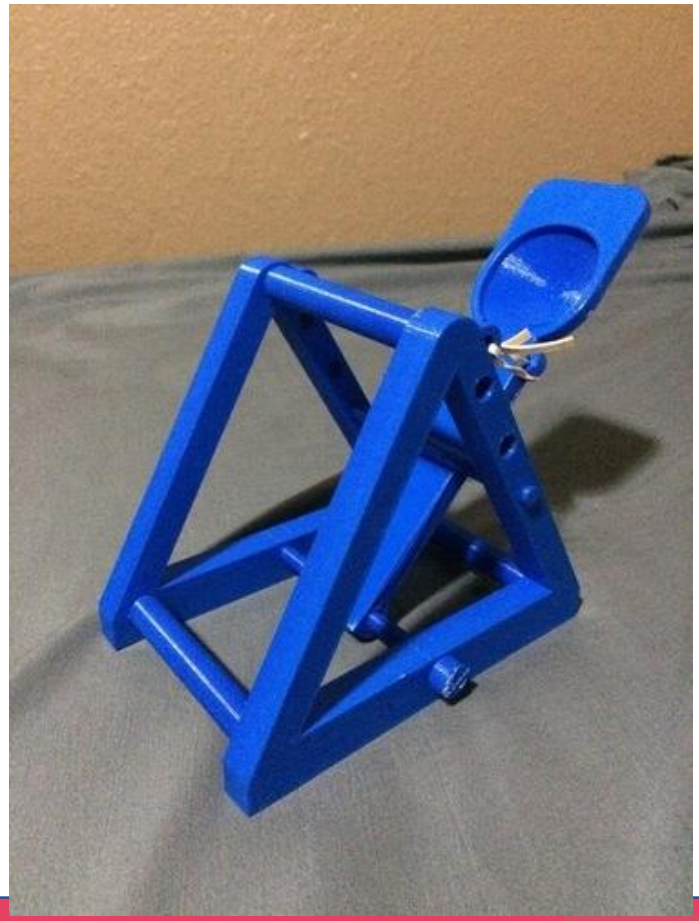

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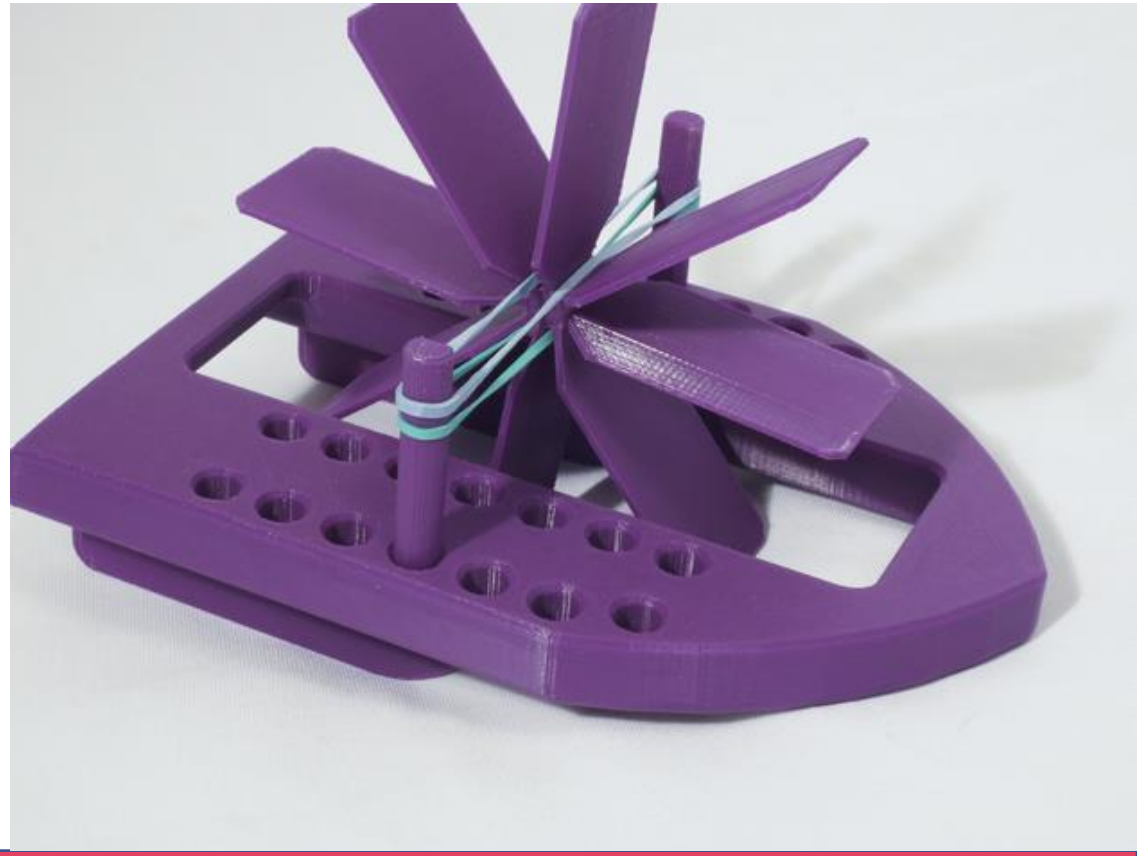
Oresmian Coordinate System

What a child might say:

- The further back i place the paddle, the further the boat goes.
- Three paddles will make the boat go the furthest.
- When as little of the hull as possible is in the water, the boat will go the furthest.



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