

# Teaching with Tinkercad

# Code, create, connect with Tinkercad and Scratch



# Get Ready

- Go to [tinkercad.com/login](https://tinkercad.com/login) and log in to your account
- If you don't already have one, we encourage you to create a free Tinkercad account so you can experiment and create along with us: [tinkercad.com/join](https://tinkercad.com/join)



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- Go to [scratch.mit.edu](https://scratch.mit.edu) and log in to your account.
- If you don't already have one, we encourage you to create a free Scratch account so you can experiment, create along with us, and save your work: [scratch.mit.edu/join](https://scratch.mit.edu/join)



# Today's Facilitators and Speakers



**Guillermo Melantoni**

Director of Product Management  
for Fusion 360 and Tinkercad



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Tinkercad



**Dr. Amon Millner**

Professor of  
Computing and Innovation



**Olin College**  
of Engineering



**Kellyanne Mahoney**

Education Marketing Manager



**AUTODESK**  
Tinkercad



**Maren Vernon**

Learning Resource Designer,  
[@algorithmar on Scratch](#)  
[@CodifiedConcepts on Tinkercad](#)

**SCRATCH**<sup>TM</sup>  
FOUNDATION



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# Goals



Explore the future of computer science and AI education



Bring coding and making together



Empower diverse learners through choice and creativity



Extend and connect student projects across platforms



Build confidence for CSEdWeek and beyond



# Agenda

01

Reimagining CS Education with AI

02

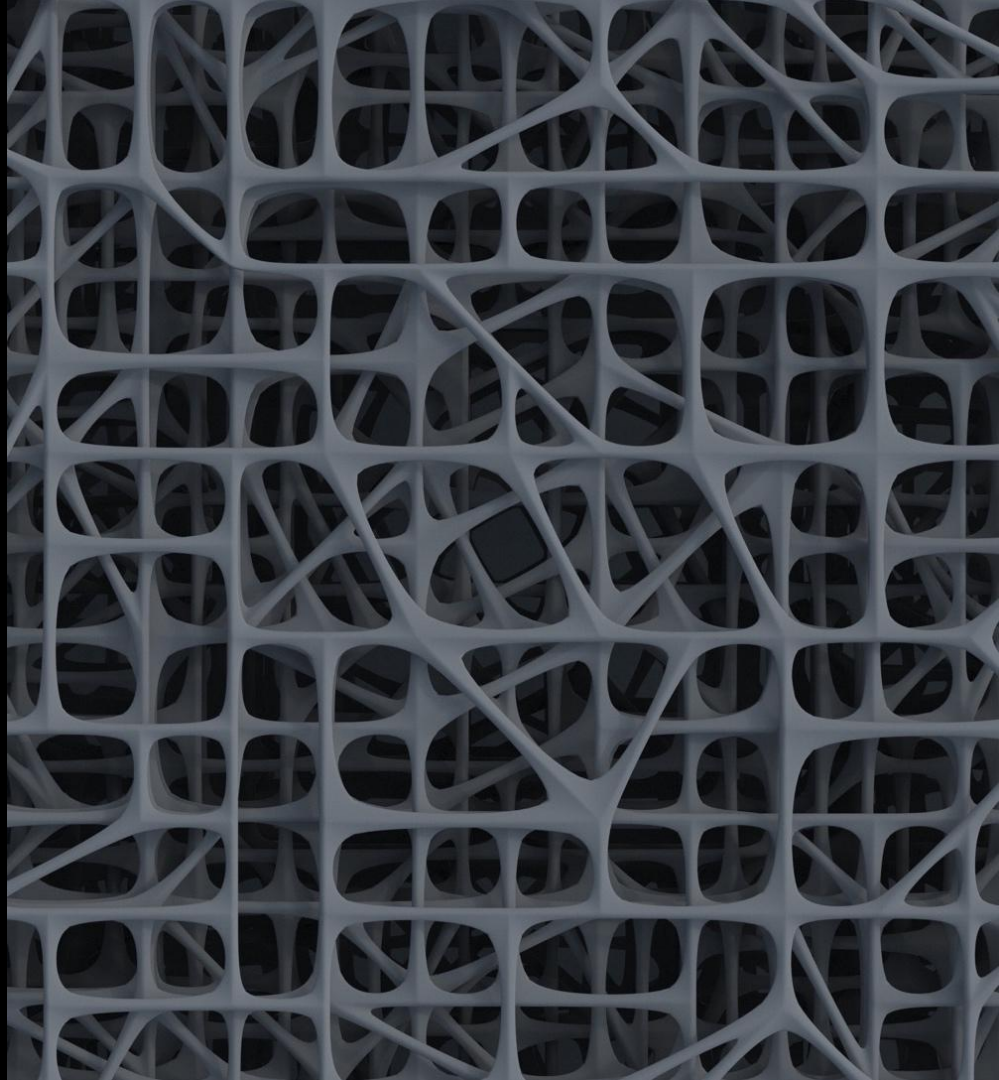
Lighting Up a Story in Tinkercad Codeblocks

03

Animate Using Scratch (and try Face Sensing AI!)

04

Q&A





# Reimagining CS Education with AI



**Olin College**  
of Engineering

# Maximizing the Creative Partnership Potential of AI while Minimizing Mischief

**Amon Millner**  
**November 20, 2025**

# Professional Identities

- A Professor of Computing and Innovation at The Olin College of Engineering
- I make tools, technologies, and contexts for creative learning



# Connections to this Panel's Theme



SCRATCH



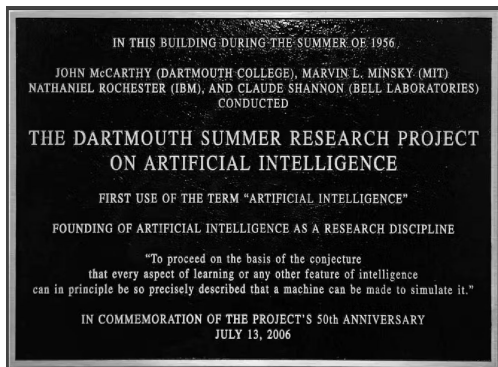


# Swiss Army Knife AI Framing

- This type of knife can be used in many ways
- A creative partner
- An agent of mischief
- Bottom line: they have double-edged blades



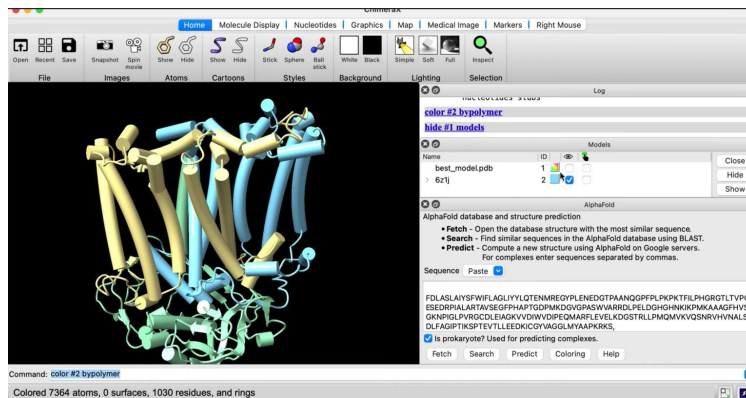
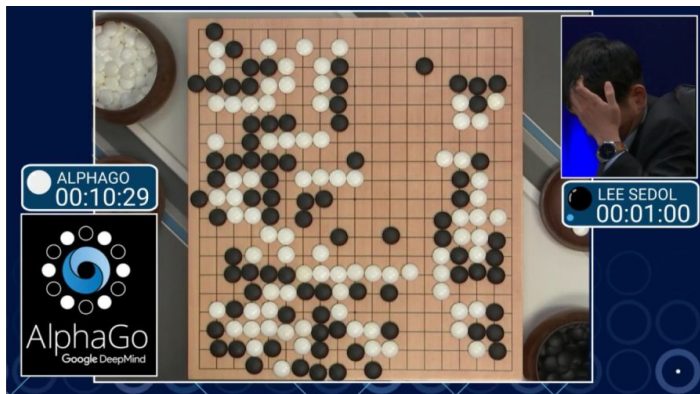
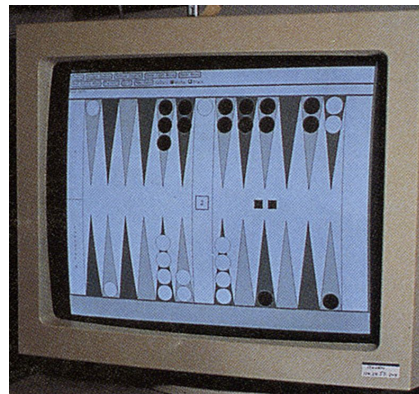
# A Few AI Flavors Over Time



I'm happy to announce that ELIZA is now running again on CTSS!

r eliza

W 1835.0  
EXECUTION.  
WHICH SCRIPT DO YOU WISH TO PLAY  
200  
HOW DO YOU DO . PLEASE TELL ME YOUR PROBLEM  
INPUT  
Men are all alike.  
IN WHAT WAY





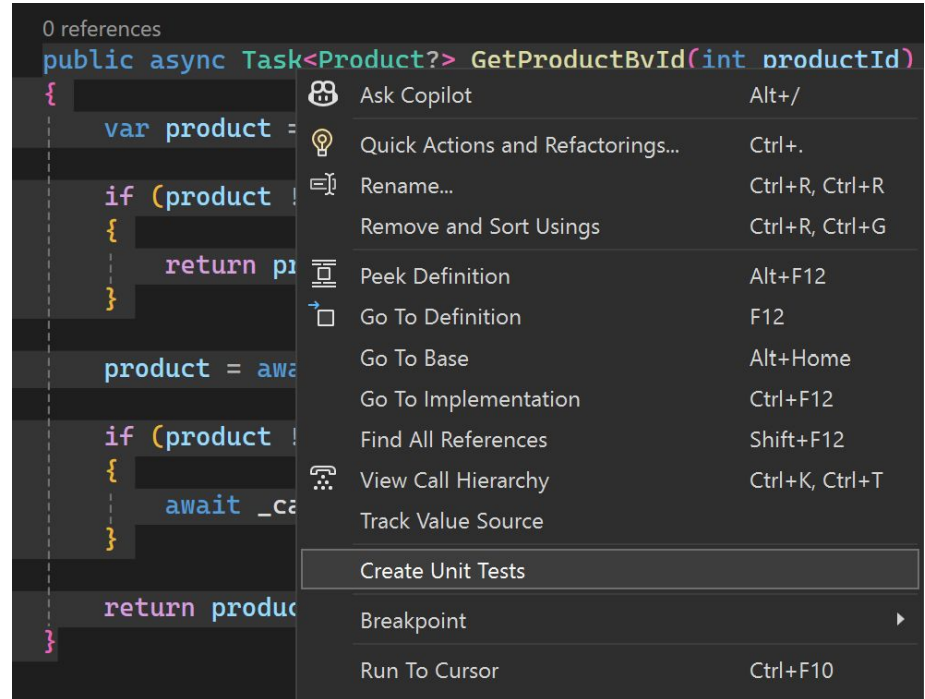
# Overriding AI's Abbreviation

- A.I. = Artificial Intelligence
- For the next few slides, I'm going to override what the "A" can mean.
  - Amplifying
  - Amputating
  - Augmenting
  - Attenuating
  - Amazing
  - Annoying

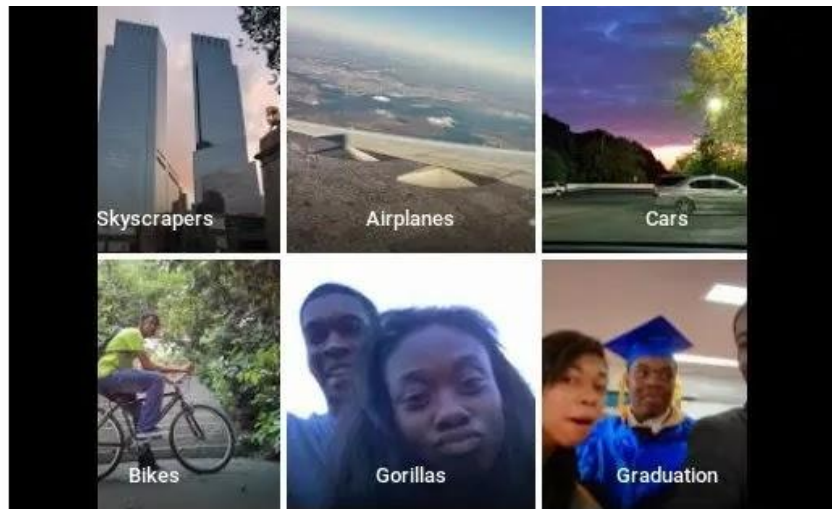
# AI - Amplifying and Amputating



# AI - Amplifying and Amputating in Coding



# AI - Augmenting and Attenuating



diri noir avec banan @jackyalcine · Jun 29

Google Photos, y'all [redacted] My friend's not a gorilla.



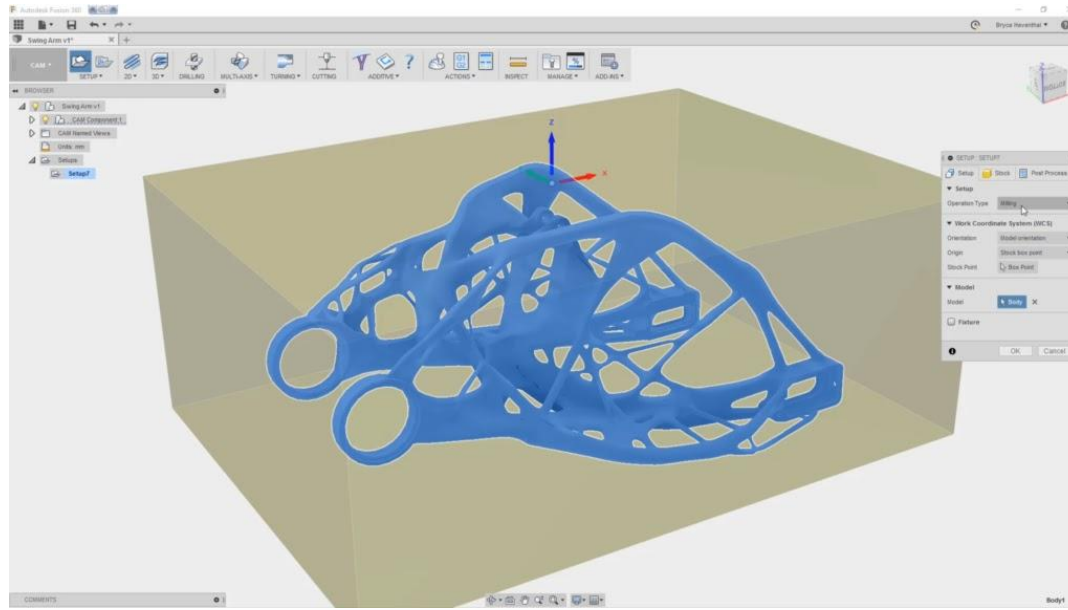
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394



# AI - Augmenting and Attenuating in CAD





# AI - Amazing and Annoying in Cartoons

**LYLA** IN THE **LOOP**

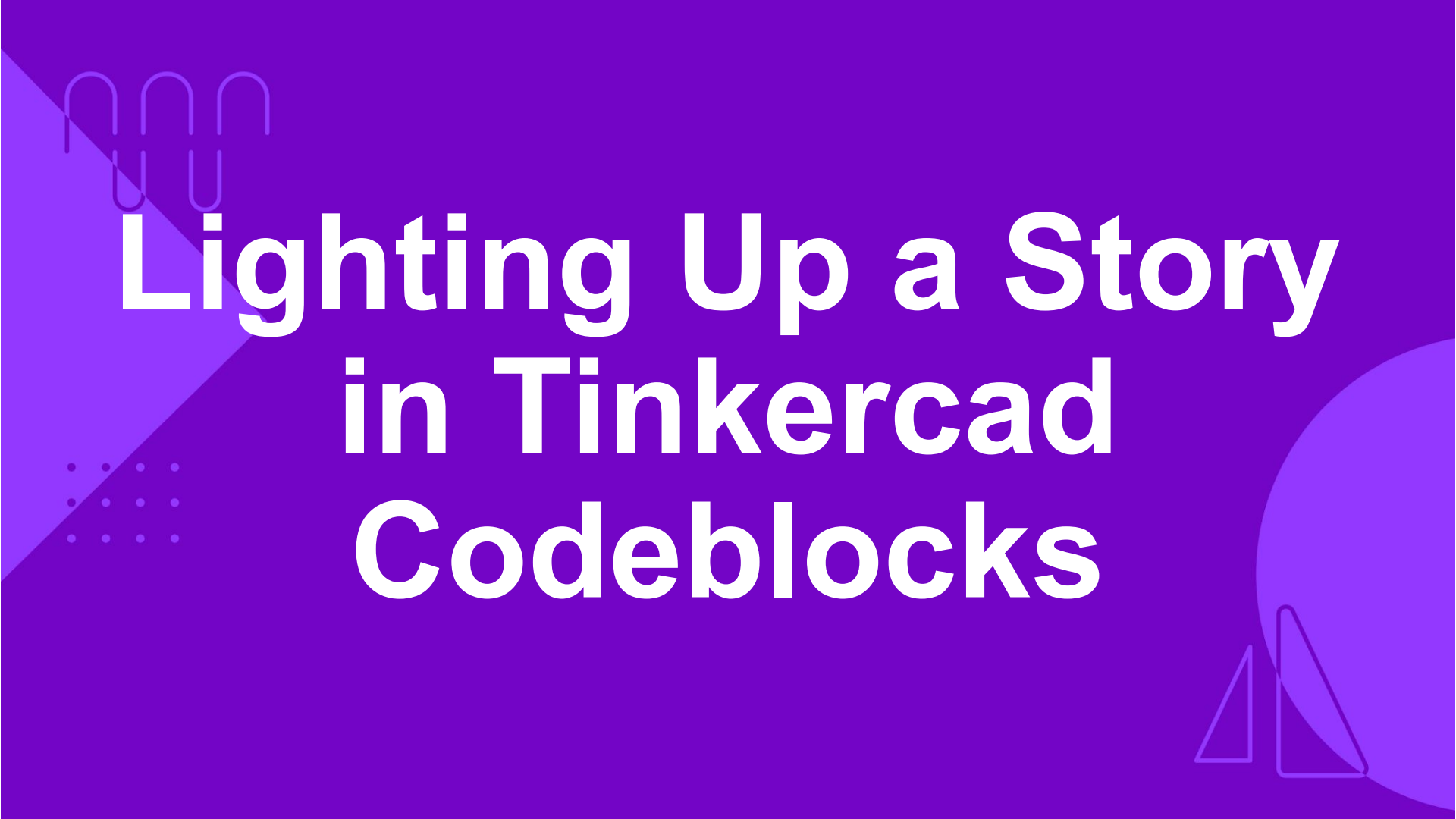


# One Last Override: Authentic Instructors

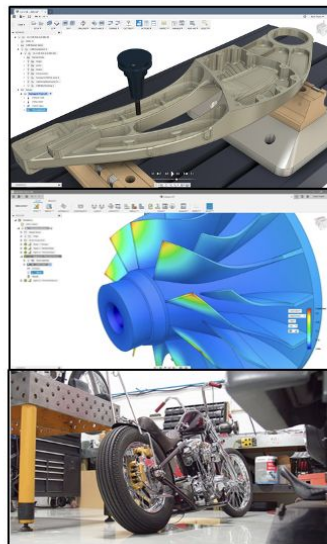


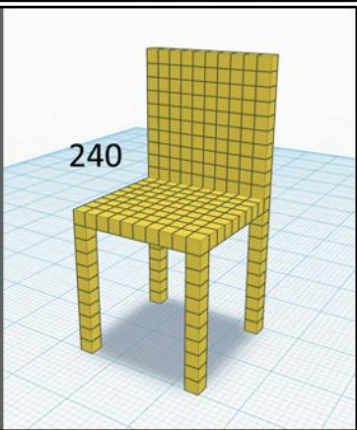
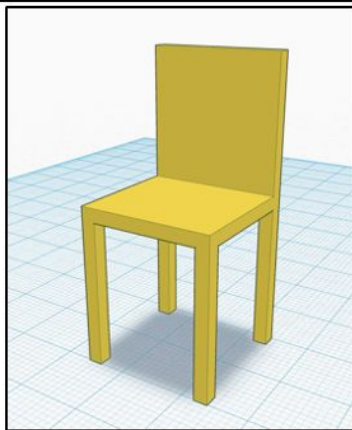
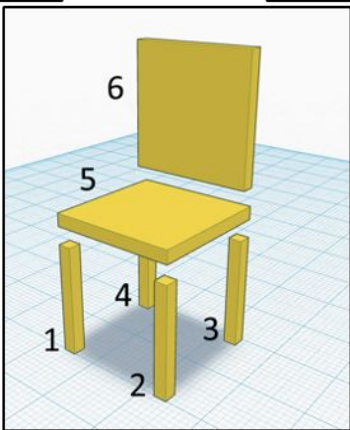
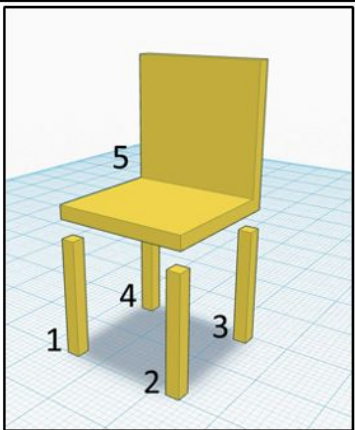
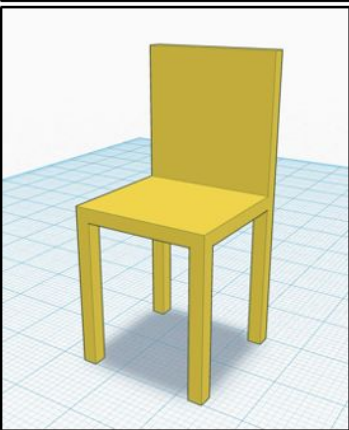
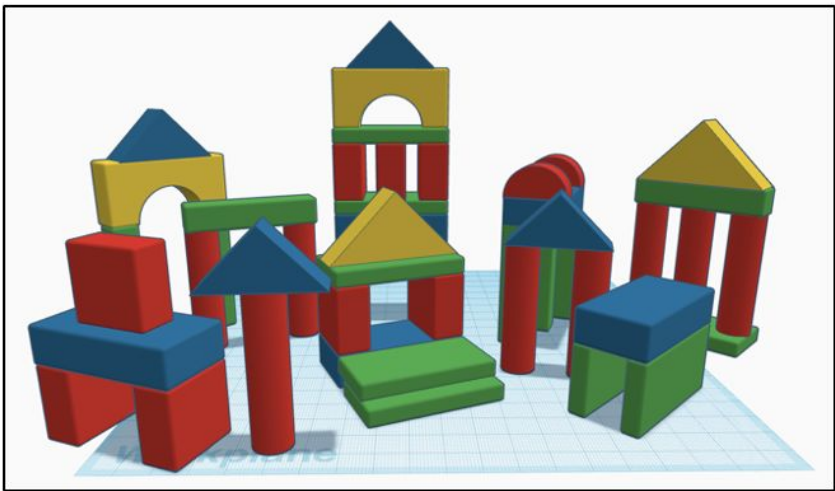
chat |

**How can you help students see AI as something they shape — not something that shapes them?**

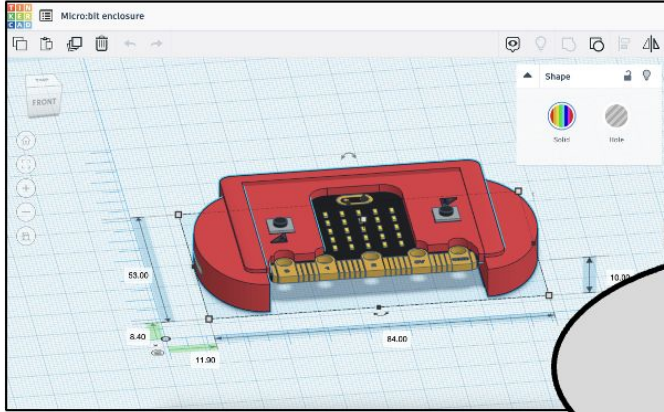


# Lighting Up a Story in Tinkercad Codeblocks

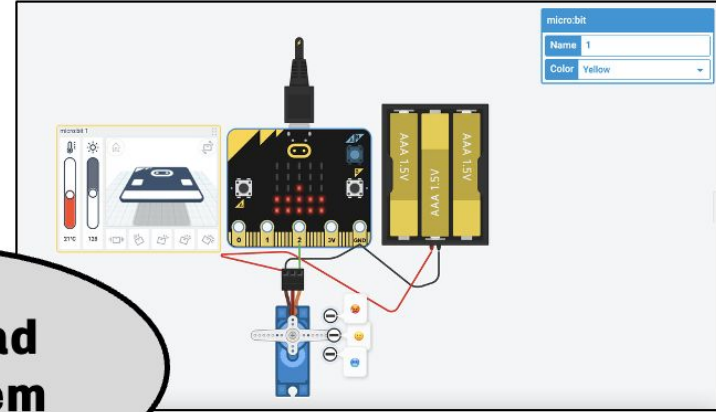






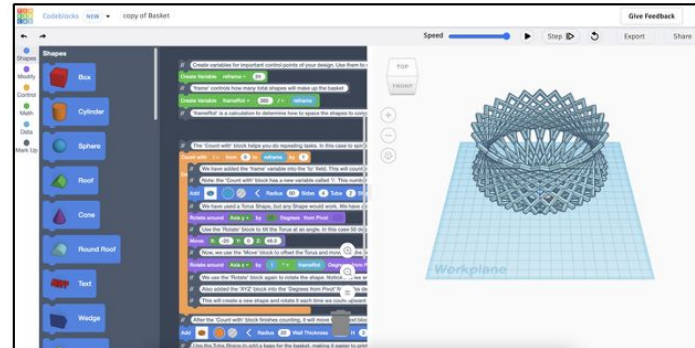


**3D design, making and simulation**



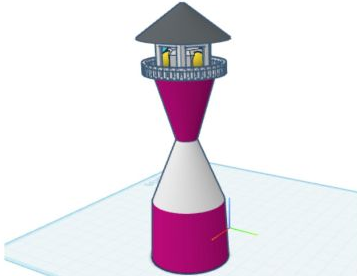
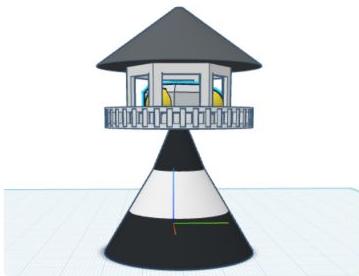
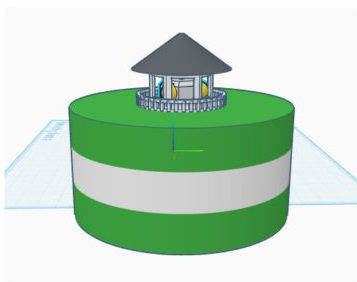
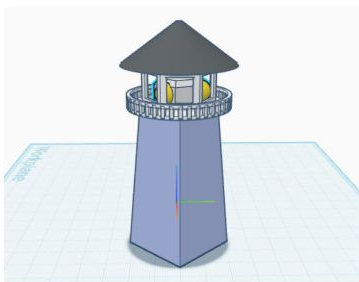
**Electronics design and simulation**

## 3D design via visual programming



# Light Up a Story with Code: From Tinkercad to Scratch

A cross-platform, classroom-ready project that helps students design in 3D with code and bring their creations to life through storytelling in Scratch.



- Integrate an easy, ready-to-use lesson.
- Introduce core computational thinking concepts.
- Support interdisciplinary STEM, art, and design learning.
- Enhance CSEdWeek and Hour of AI plans.
- Extend learning with optional creative add-ons.
- Download complete teaching and reflection resources.

## Students will...

- Remix 3D designs through code.
- Export models and animate in Scratch.
- Build strong computational thinking skills.
- Apply math concepts in 3D space.
- Express creativity through design storytelling.
- Explore AI-powered coding interactions.

chat |

**What scaffolds or supports might help beginners succeed with a Codeblocks project like this?**



# **Animate Using Scratch**

**(Bonus: Try Face Sensing AI!)**

# Decomposition, Iteration, and Art

To create objects in Tinkercad, you'll need to think about all the elements you'll need and how to define them (different colors, different heights, different shapes...) to create the final form.

Breaking an object or a task into smaller pieces is the process of **decomposition**, a key task whether you are drawing or coding!

Moving between 2D and 3D challenges us to design from different perspectives and **iterate** on our creation to make it work in each space.

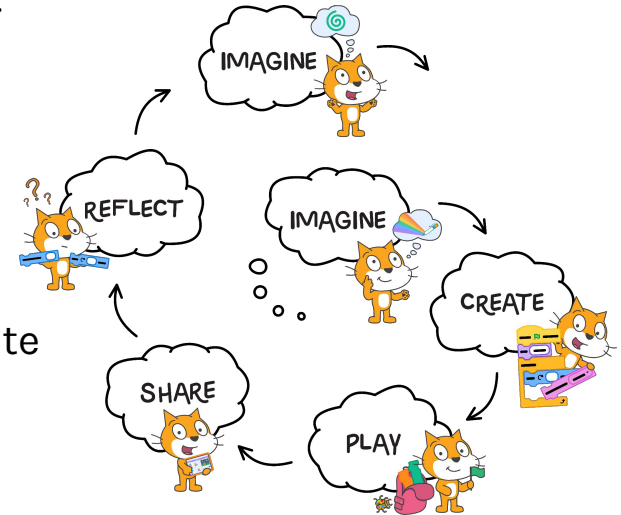


# What is Creative Learning?

You're engaged in creative learning when you develop ideas or things that are meaningful to you or to others you care about.

As facilitators, we want to support **playful learning** and **tinkering mindset values** so that participants can:

- Engage playfully in **projects** that are meaningful to them and elicit joy
- Collaborate with **peers** to experiment, share, and celebrate ideas
- Develop a mindset that is **comfortable with the discomfort** of getting stuck
- And think critically about **strategies for getting unstuck**



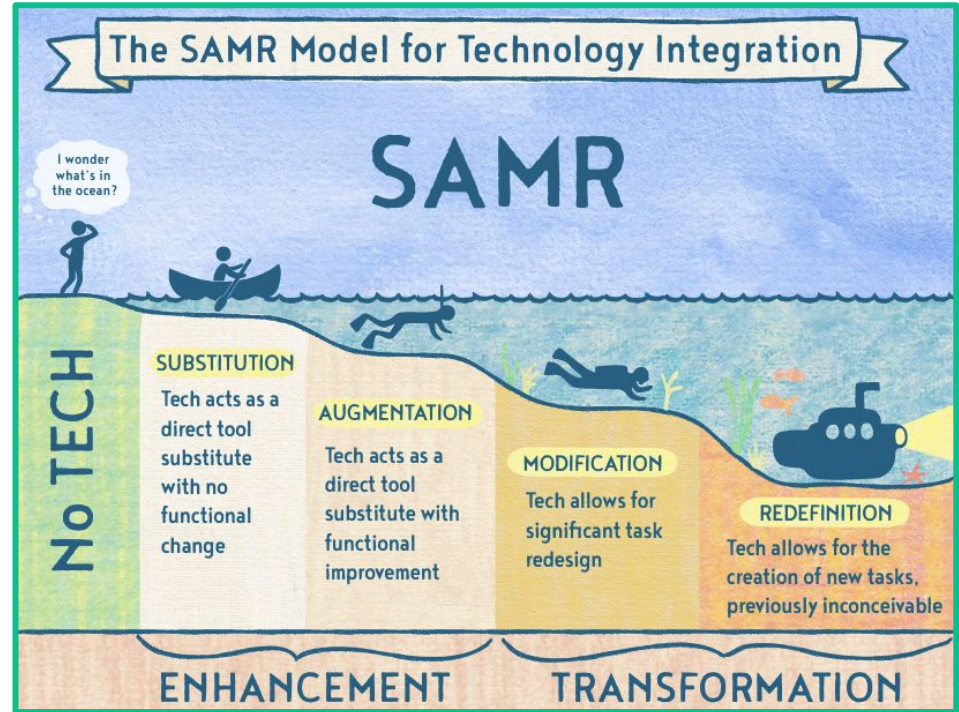
[Learn more about Scratch's Creative Learning Philosophy](#)



# Why Scratch?

How does Scratch enhance/transform the learning experience? What affordances does Scratch offer?

- Migrate knowledge between the physical and digital worlds
- Utilize an Interactive and expressive canvas to share ideas
- Publish to an authentic audience of peers
- Cultivate digital citizenship in a safe, guided environment



Source: [Louisiana Department of Education](#)

# Getting Started

Click “Create” or log in to your free account to save projects.

go to: [scratch.mit.edu](https://scratch.mit.edu)

Set your language and block color mode.

Choose a sprite. Drag and drop code blocks to create a script.

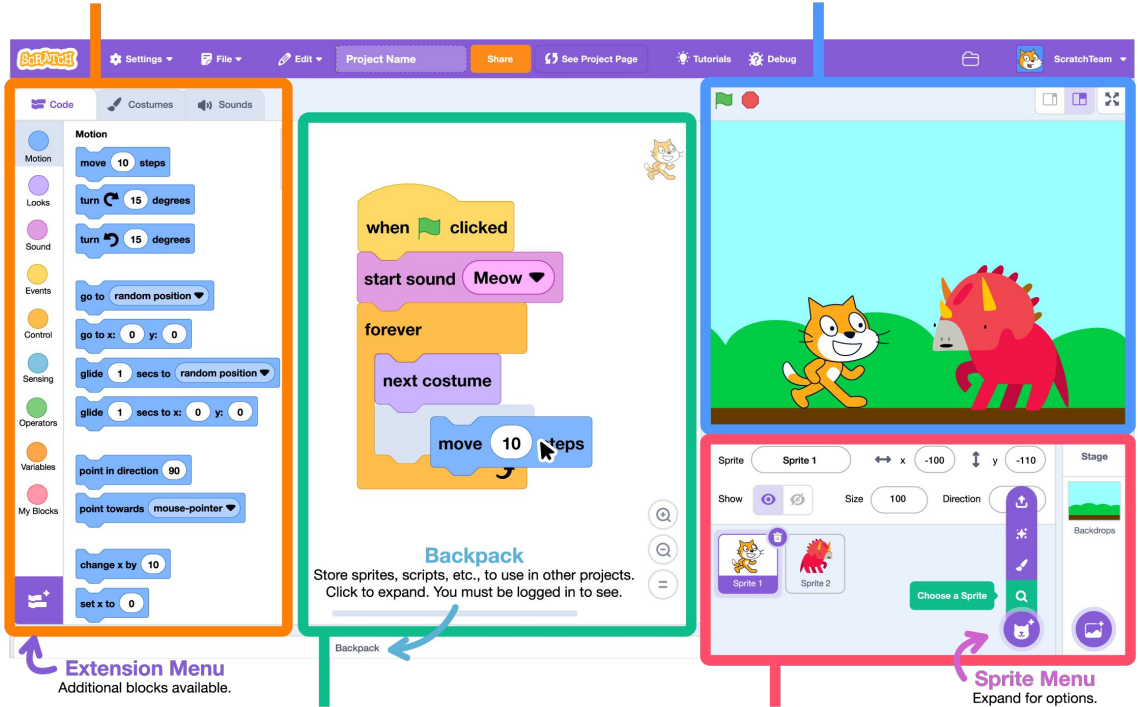
[Learning Library / Getting Started](#)

## Block Palette

Blocks for coding your projects.

## The Stage

Where your creations come to life.



## Coding Area/Script Area

Drag in blocks and snap them together.

## Sprite Area

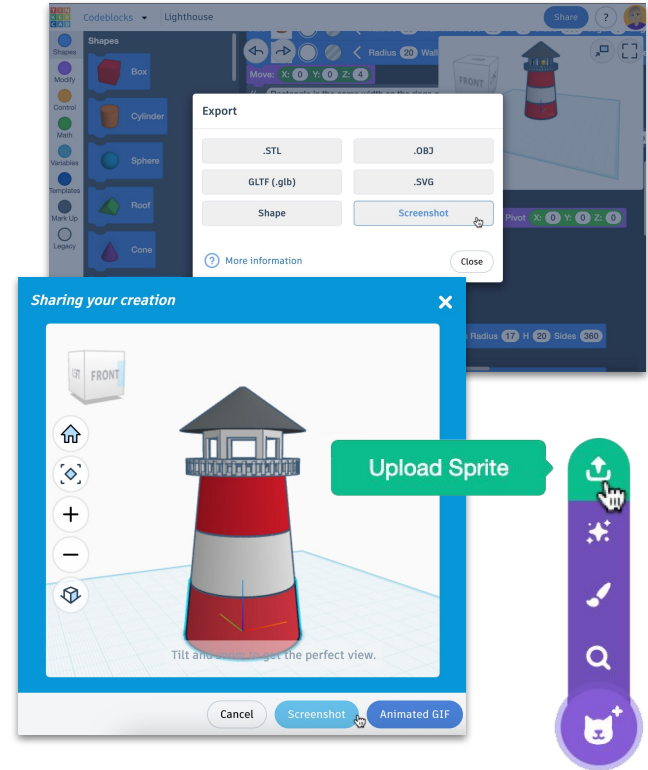
Click the thumbnail of a sprite to select it.

# Prepare the Tinkercad Asset for Scratch

Create a 3D backdrop or sprite using Tinkercad Codeblocks to create your own shape.

1. Click “**Share,**” and then choose “**Screenshot.**” Rotate and tilt objects, choosing your position/angle view.
2. Export a screenshot (the workplane will be hidden).
3. **Crop the image and/or remove the background** with the Scratch Paint Editor select and eraser tools (after uploading) or using an application (like Remove.bg or Photoshop) before uploading to Scratch, if desired.
4. **Upload the final result into Scratch as a sprite or backdrop costume** (see Scratch’s [resources on Sprite Creation here](#)).

See Maren’s example [tinkercad.com/codeblocks/cYksubSThwI-lighthouse](https://tinkercad.com/codeblocks/cYksubSThwI-lighthouse)



# What Will You Create?

Allow multiple pathways of engagement to foster a wide **diversity of projects** and support different experience levels.

For example, a lighthouse could be:

- scenery where we add a rotating light and an active ocean scene behind it in a storytelling project
- a chess piece in a game project
- the focal point of an information project about a famous lighthouse

Try the [Scratch Design Journal](#) to brainstorm and plan.

Mixed experience levels in class? Consider **pair programming** opportunities.



## Wide Walls

# Animate Your Object Using Scratch

Animate the scene or sprite (explore Scratch's Learning Library resources for more ideas).

Possible ideas:

- Add a sound
- Layer digital drawings on top or below to add features
- Use effects blocks like “set brightness” or “change ghost”
- Move the sprite around the stage
- Place in a scene and create a story
- Set in a parallax

See Maren's example Scratch project ([projects/1177669539](https://scratch.mit.edu/projects/1177669539)).



# Creative Applications for AI

Want a challenge that gets your body moving? Try using Scratch's recently launched **Face Sensing blocks** and the features of your face to control the animation!

These AI-powered blocks use a machine learning model to detect if they see a face and where a nose, eyes, ears, mouth, etc., are. When you use Face Sensing blocks, **only your computer can sense your face. None of your data is stored or sent to Scratch** or any other site. Making it a safe, fun, and creative way to explore the possibilities of AI.



*Find more on Face Sensing, including a lesson plan, example projects, and student-facing coding cards.*

*See Maren's example Scratch project ([projects/1216333706](https://scratch.mit.edu/projects/1216333706)).*

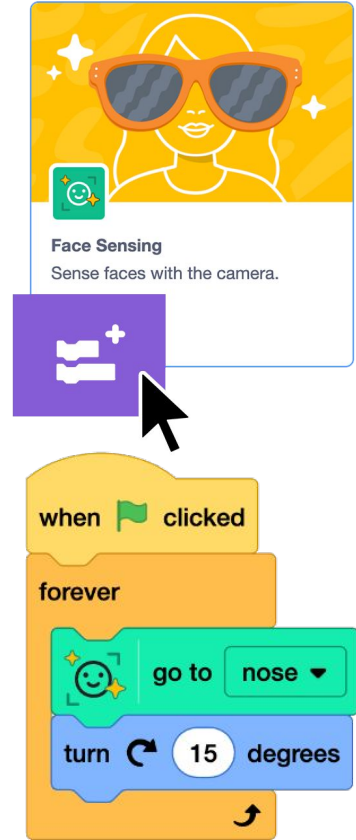


# Try Controlling Sprites with Your Face!

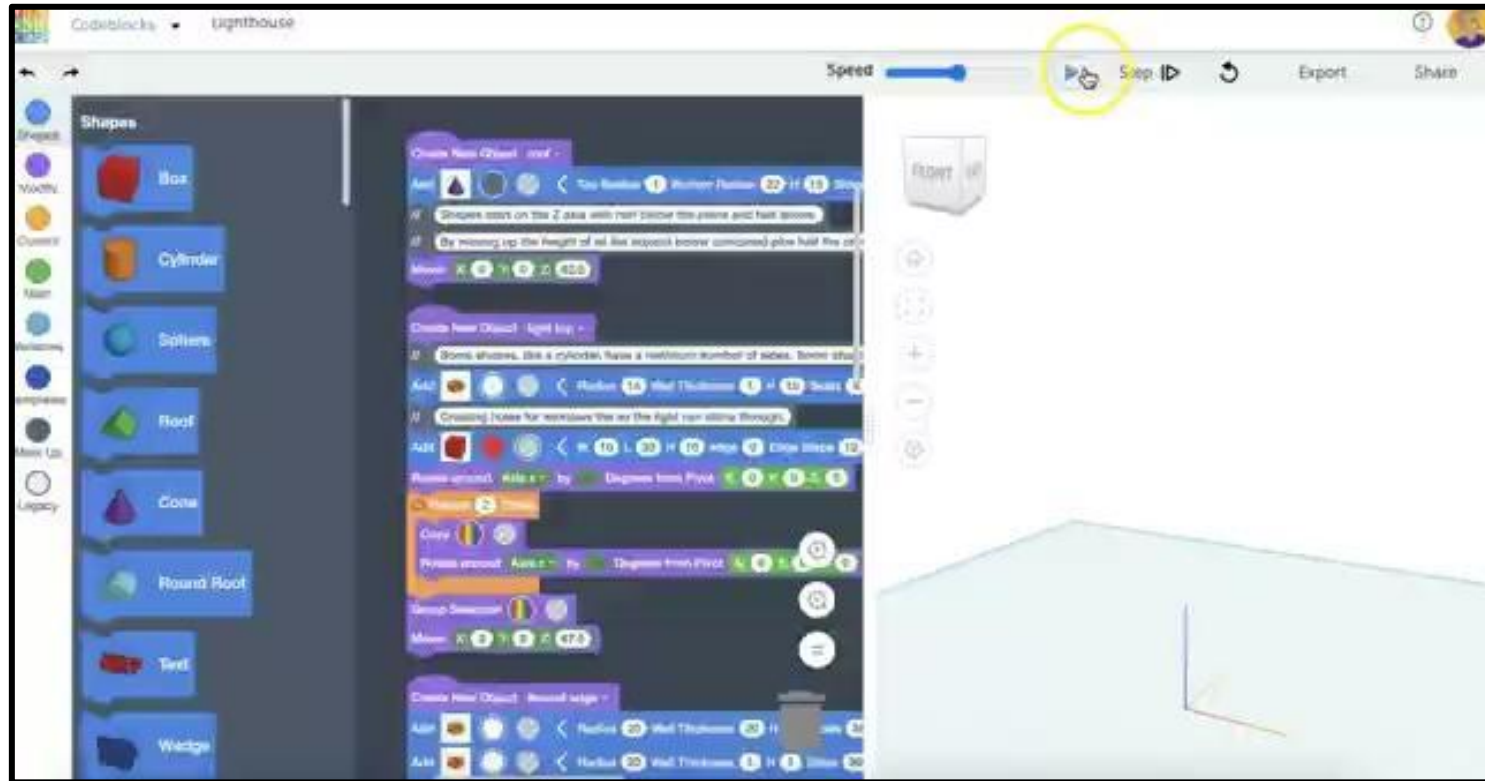
- Add the **Face Sensing** extension blocks by clicking on the extension menu in the lower-left corner of the project editor. Face Sensing blocks use the device's camera. If you haven't enabled the camera in your browser, you may be prompted to give permission.
- Click the **“go to nose”** block while your face is visible on the stage. Did the sprite go to your nose? What if you choose another feature?
- How can you make the sprite **constantly follow your nose**? (Encourage them to find a block to help, like a forever loop.)
- How can you **utilize additional blocks** (like “turn clockwise 15 degrees” from the Motion category) to add more animation?

Find more on Face Sensing, including a lesson plan, example projects, and coding cards.

See Maren's example Scratch project (projects/1216333706).



# Example Flow from Tinkercad into Scratch



# Why We Love This Activity

- Allowing learners to create their own objects can speak to their passions and interests.
- There are multiple pathways to engage learners of various experience levels, as well as opportunities for pair programming.
- It provides opportunities to highlight thinking skills (decomposing, problem-solving, testing, iterating).
- As facilitators, we can model and walk learners through the creative learning spiral (Imagine, Create, Play, Share)



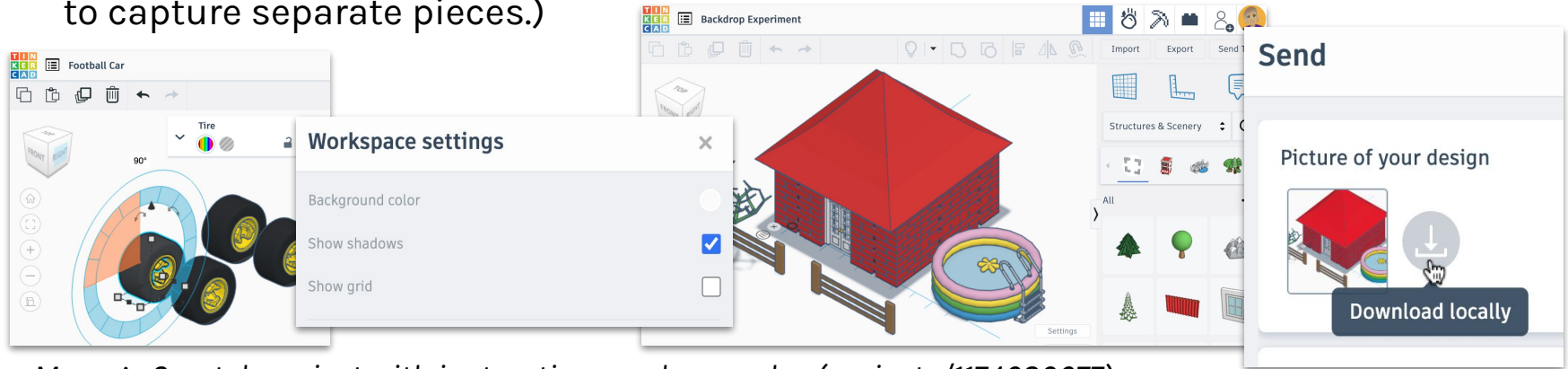
**As we say at Scratch, “What will you create?”**

**Additional Things to Try...**

# Use Pre-made Shapes from Tinkercad in Scratch

You could create a 3D backdrop or sprite using the shapes in the Tinkercad 3D design shape library, instead of using Codeblocks.

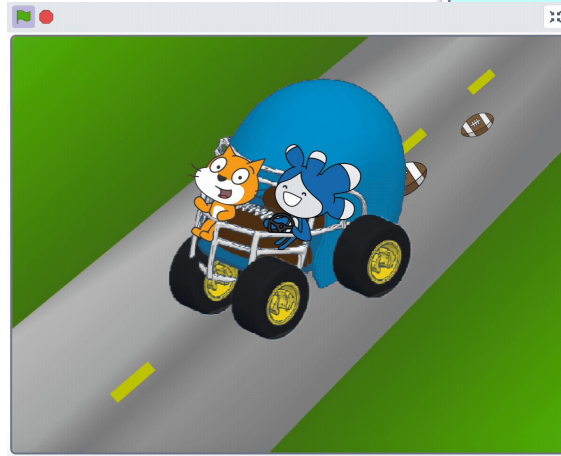
1. Rotate objects, and choose your position/angle view. Uncheck “show grid” in settings and choose if you want shadows or not.
2. "Send to" download a picture. (Use the lightbulb to hide and show objects if you want to capture separate pieces.)



[See Maren's Scratch project with instructions and examples \(projects/1174680677\).](https://scratch.mit.edu/projects/1174680677)

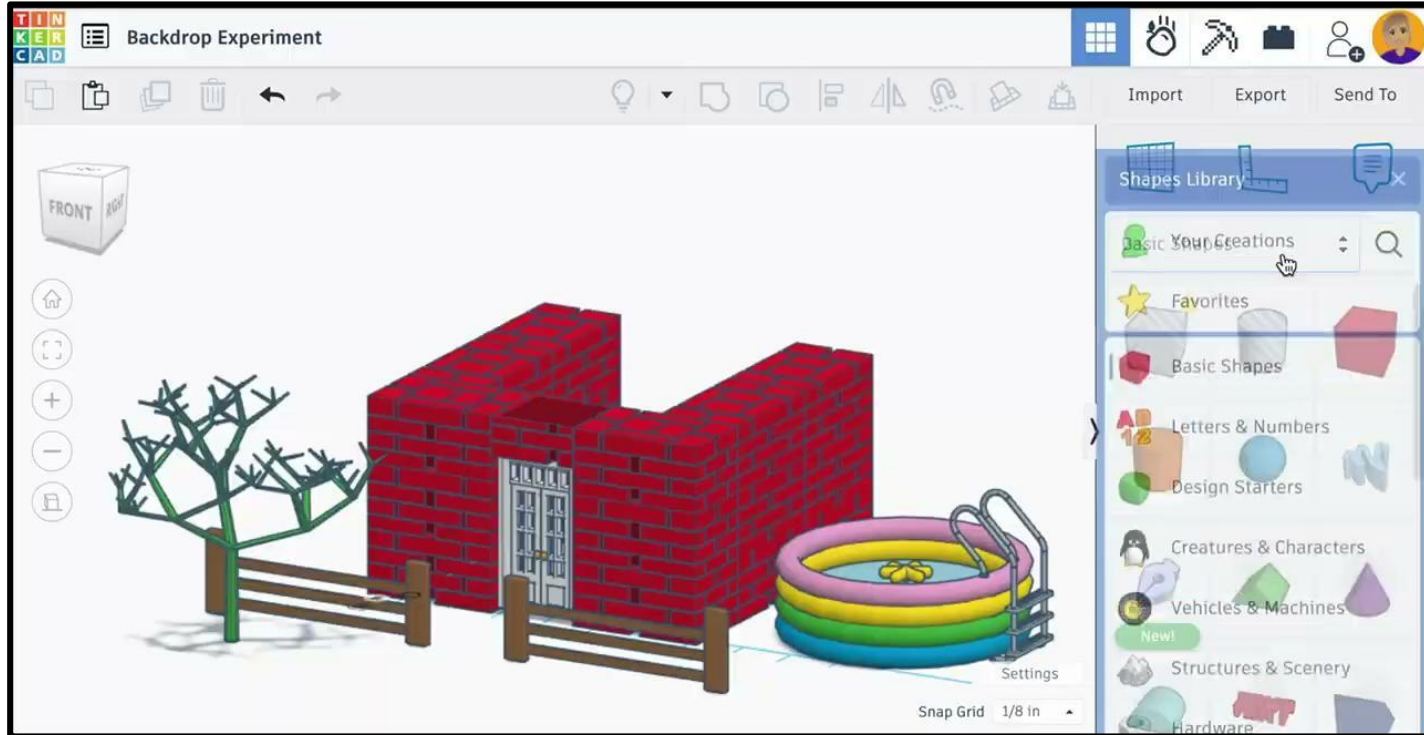
# Use Pre-made Shapes from Tinkercad in Scratch

3. Remove the background with the Scratch Paint Editor eraser tool (after uploading) or an application (before uploading), if desired.
4. Upload the final result into Scratch as a sprite or backdrop costume (see Scratch's [resources on Sprite Creation here](#)).
5. Animate the scene or sprite ([explore Scratch's Learning Library resources](#)).





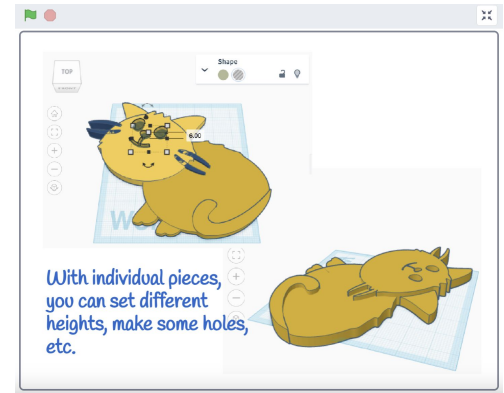
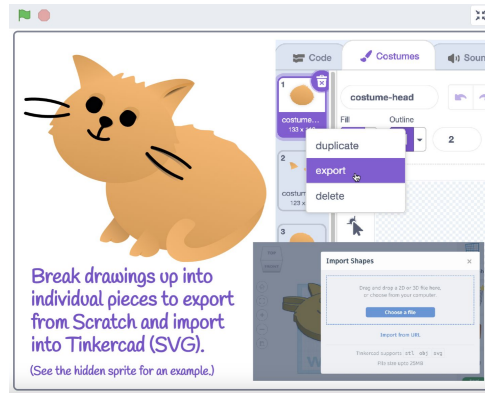
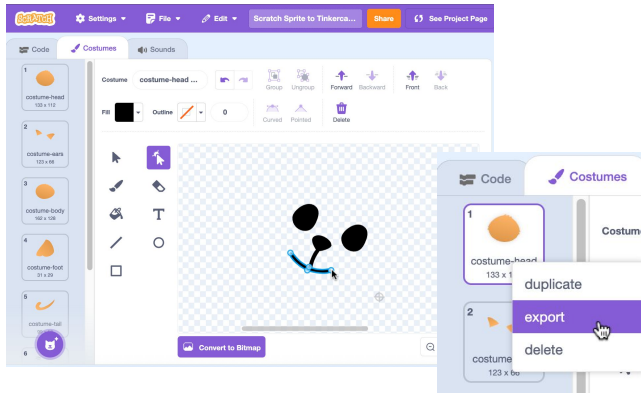
# Use Pre-made Shapes from Tinkercad in Scratch



Note:  
Background  
was removed  
before the PNG  
file was  
uploaded to  
Scratch.

# Design in Scratch, Then Make 3D

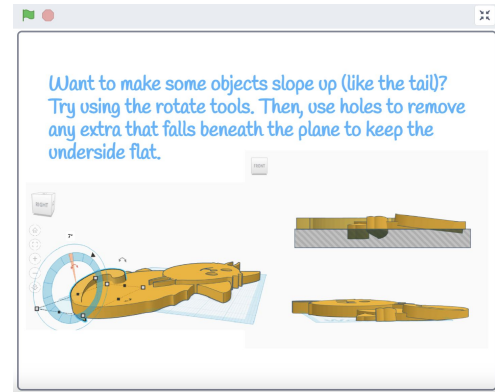
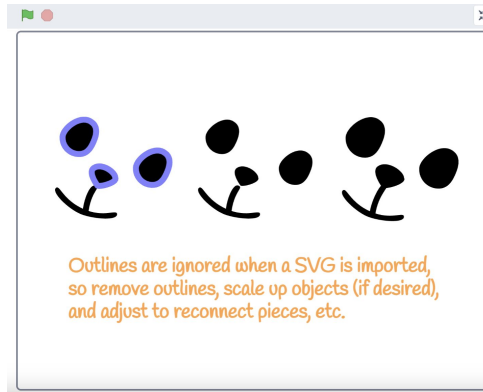
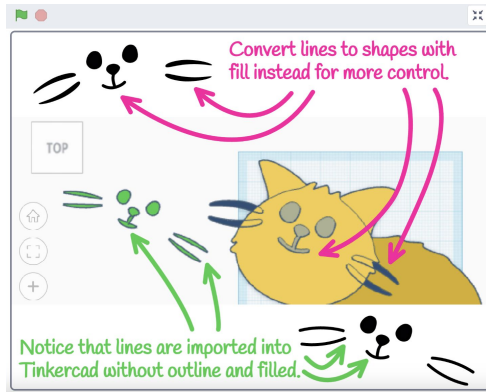
1. Make a sprite using the Scratch paint editor tools. Break drawings up into individual pieces to export from Scratch and import into Tinkercad (costumes export as SVG).
2. With individual pieces, you can set different heights, make some holes, etc.



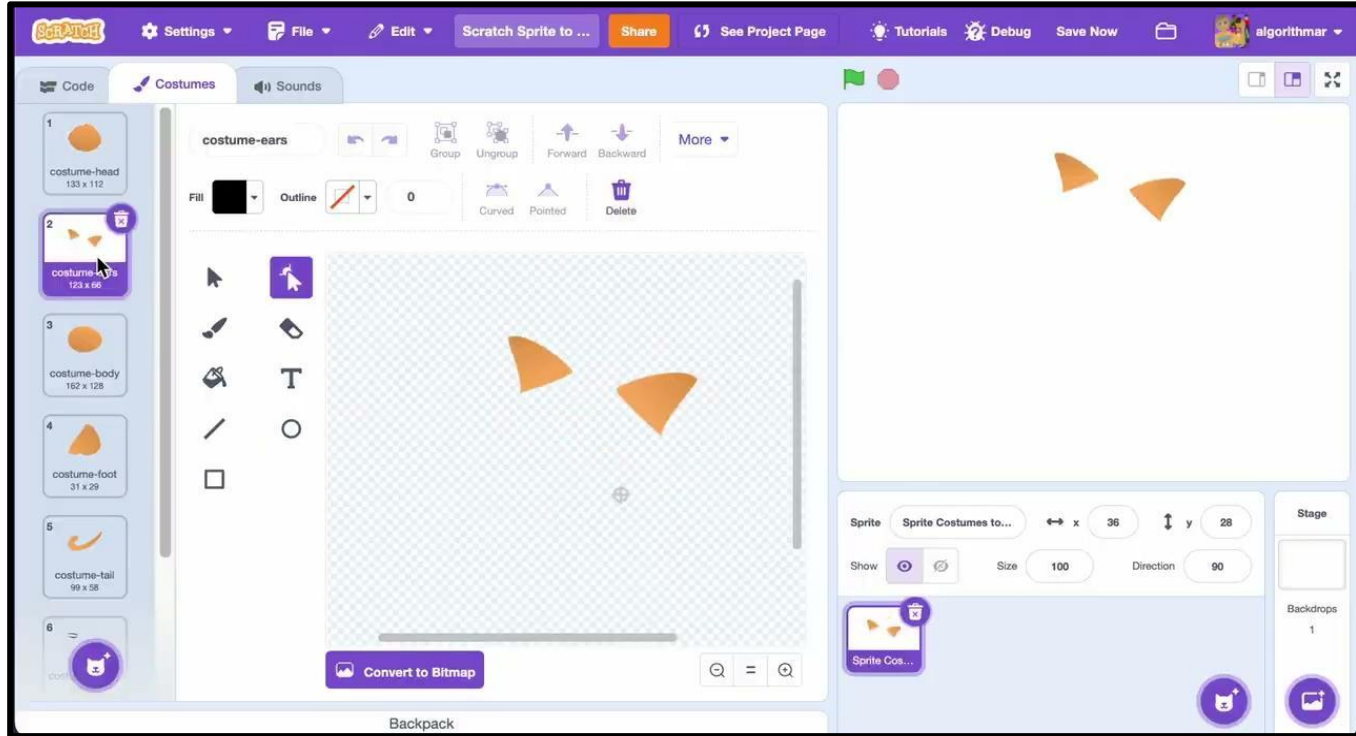
[See Maren's Scratch project with instructions \(projects/1161055858\).](https://scratch.mit.edu/projects/1161055858)

# Design in Scratch, Then Make 3D

3. Lines are imported into Tinkercad without outline and filled. Convert lines to shapes with fill instead for more control. Remove any other outlines, scale up objects (if desired), and adjust to reconnect pieces, etc.
4. Use rotate tools and holes to slope pieces and further customize.



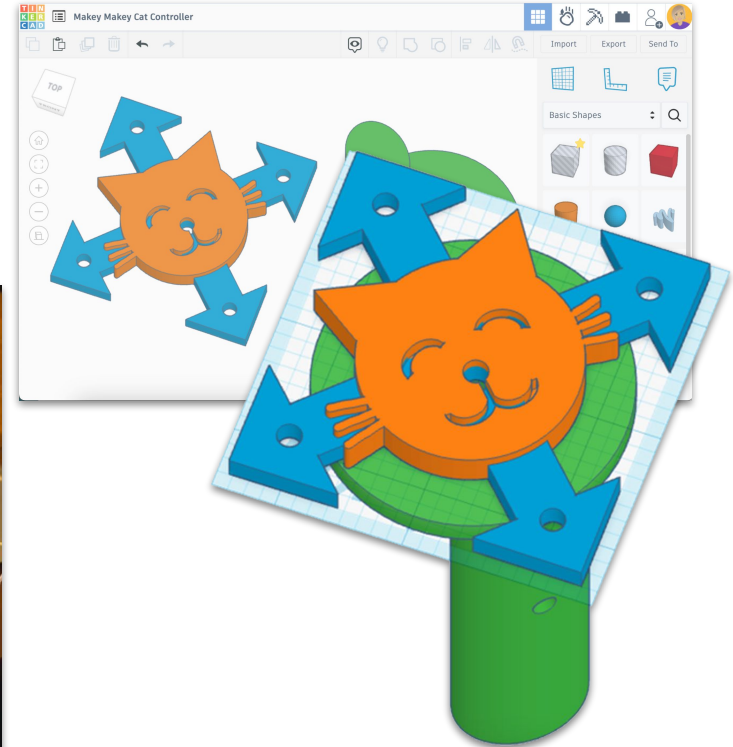
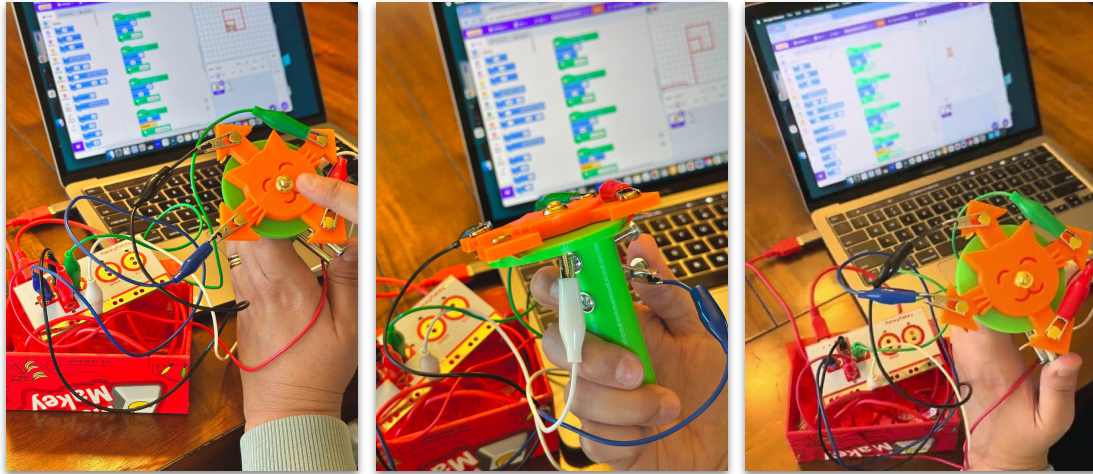
# Design in Scratch, Then Make 3D



# Create a Makey Makey Controller

Create 3D objects that can interface with Scratch, such as a Makey Makey Controller.

Maren's design example is available here:  
[tinkercad.com/things/93F8ZT1XY3G](https://tinkercad.com/things/93F8ZT1XY3G)



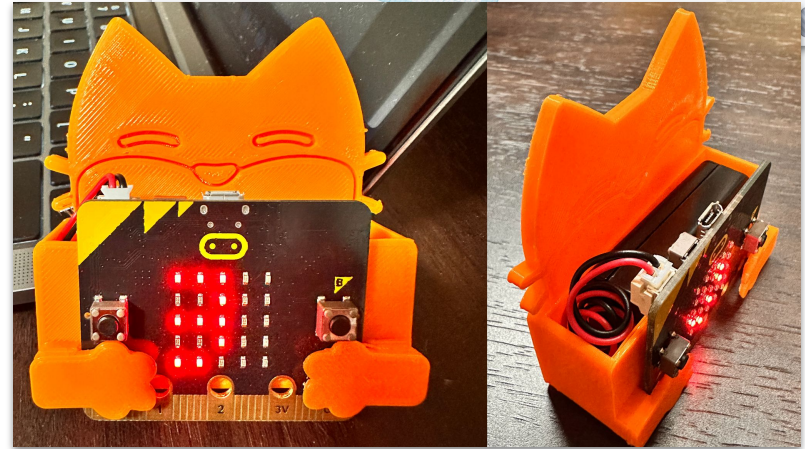
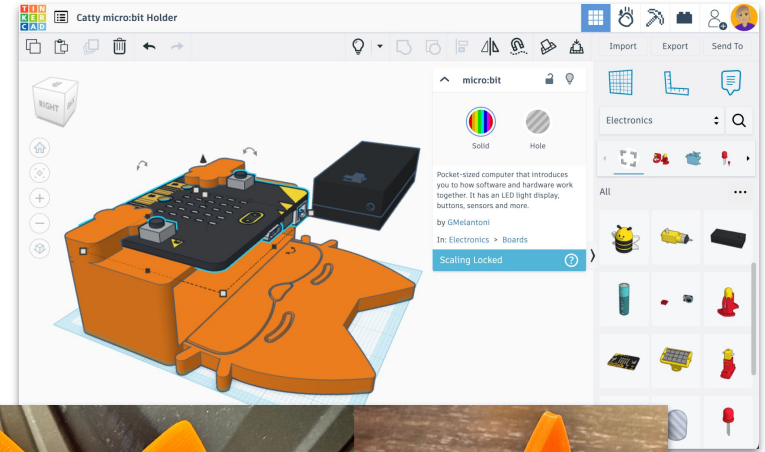


# Create a micro:bit Holder

Create 3D objects that can interface with Scratch, such as a micro:bit Holder.

You can use the micro:bit shape under Electronics to ensure fit. There is also a AAA battery pack available.

Maren's design example is available here:  
[tinkercad.com/things/esjZW7eSGqB](https://tinkercad.com/things/esjZW7eSGqB)





chat |

Please share your questions in the chat.

What surprised you, or what new idea was sparked by today's conversation?

Have you tried an activity like this in your classroom? Any tips to share with us and fellow educators?

# Grab Our Resources

Find our Instructable here: [Light Up a Story with Code: From Tinkercad to Scratch](#) ([or here](#))

## Resources from Tinkercad:

- [Official Guide to Tinkercad Codeblocks](#)
- [Tinkercad Challenge](#)
- Autodesk's [Design & Make Skills badges](#)
- [Light Up a Story with Code Lesson Plan](#)



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## Resources from Scratch:

- [Scratch Learning Library](#) full of resources
- [Getting Started Guide](#)
- [Sprite Creation](#)
- [Sound and Music in Scratch](#)
- [Debugging Strategies Posters](#)
- [Creative Learning Philosophy](#)





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## Annual Educator Feedback Survey

Our annual educator survey is your chance to tell us what you think and help us make Tinkercad better! (Est. 10 min).

[Take the Survey](#)

# Teaching with Tinkercad 2025



by Autodesk Tinkercad

Playlist • 2 videos • 459 views

Kick off the school year with fresh ideas and powerful tools! Join the Tinkercad team for an interactive session...

▶ Play all



1



## Teaching with Tinkercad (Season 5, Ep. 2) - The Power of Why

Autodesk Tinkercad • 328 views • 2 weeks ago



2



## Teaching with Tinkercad (Season 5, Ep. 1) - Harness the power of...

Autodesk Tinkercad • 745 views • 1 month ago



 **AUTODESK Tinkercad**

WEBINAR FOR EDUCATORS

**Teaching with Tinkercad**

Code, create, connect with  
Tinkercad and Scratch

Thursday, November 20, 4PM PST

  
**Dr. Amon Millner**  
Professor  
Olin College of Engineering

  
**Maren Vernon**  
Learning Resource Designer  
Scratch Foundation



**COMING SOON...**

Hour  
of AI

#TinkercadScratchLighthouse







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Andrew Anagnost,  
President and CEO,  
Autodesk

Mary Hope McQuiston,  
Vice President,  
Autodesk Education Experiences

## Certificate of Professional Development

This document certifies that

**YOU**

earned

**1 hour of professional development**

**on November 20, 2025**

as a participant in

**Teaching with Tinkercad series:**  
**Code, create, connect with Tinkercad and Scratch**





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