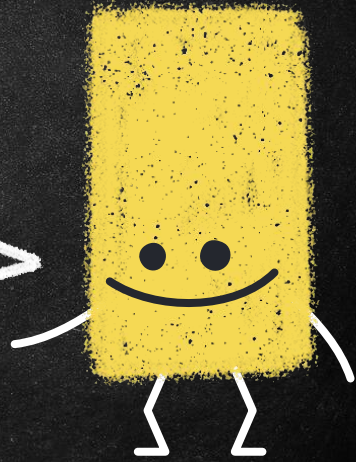


# GRAPHICS,

Transforming  
Geometric Shapes





**LEARNING TARGETS**

- ❑ I can describe types of transformations (dilation, translation, rotation, reflection)
- ❑ I can explain the connection between transformations and 3D graphics.

**OPTIONAL PRACTICE**

- ❑ I can try out AFrame by remixing a template on replit to show various transformations

HW

**DELIVERABLES**

- Review reference slides to create a scene that uses AFrame that demonstrates transformations
  - use checklist criteria
  - can use entity from class

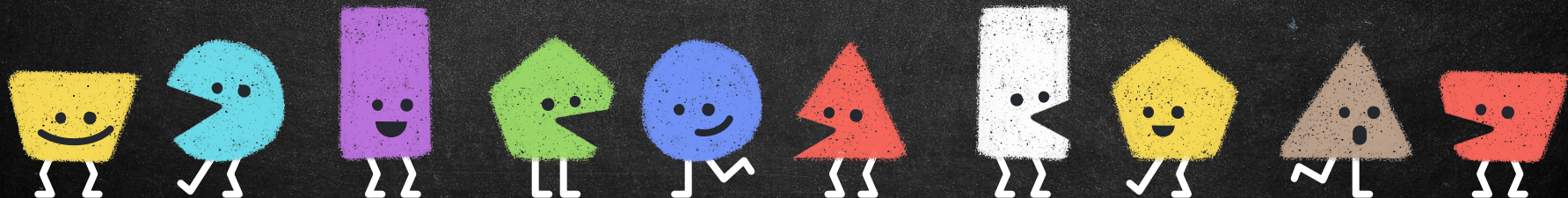
3

1

2

**LESSON****LEARNING TARGETS**

- ❑ I can describe 3D transformations and where they might be used.
- ❑ I can decide which type of transformations will work to move one figure to another.
- ❑ I can create an entity using several shapes using Aframe



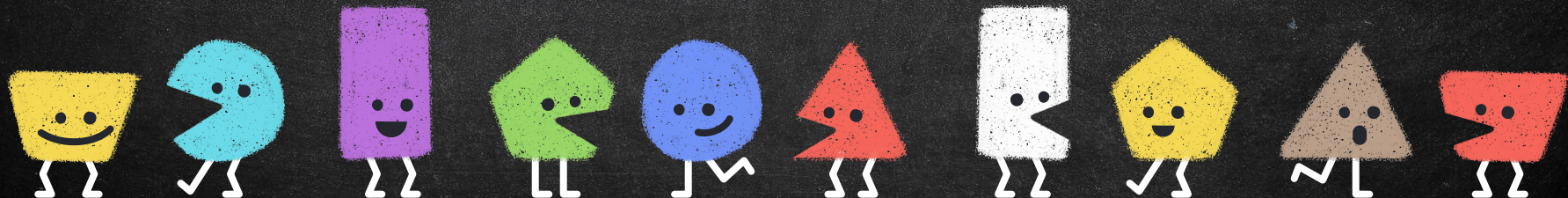




# WHY?

We are learning this because...

- Once a graphic is drawn on the screen, it's incredibly helpful to move it/transform it rather than create it from scratch every time
- Simulations and immersive tech can revolutionize education, training, tourism, medical, gaming, etc.





# WHY? (CONT.)

## OPTIONAL DEEP DIVE!

*Learn about the introduction  
to computer graphics and 2D  
Graphics*

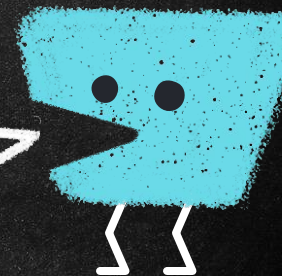
[video]

[Screens & 2D Graphics: Crash  
Course Computer Science  
#23 | PBS](#)

*Learn how 3D graphics are  
created and rendered on a 2D  
screen*

[video]

[3D Graphics: Crash Course  
Computer Science #27 | PBS](#)







# WHAT?

We will be learning:

- How to make changes to a geometric shape on a 3D coordinate plane.  
(by changing points and/or vectors)

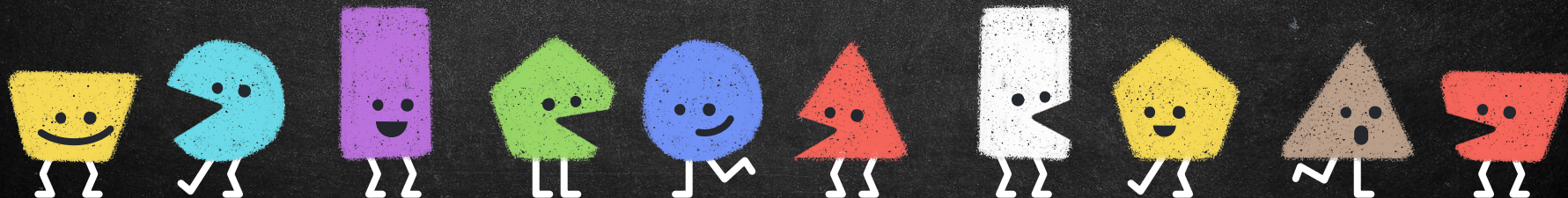
→ Types of transformations:

\*Rotations

\*Dilations

\*Translations

\*Reflections

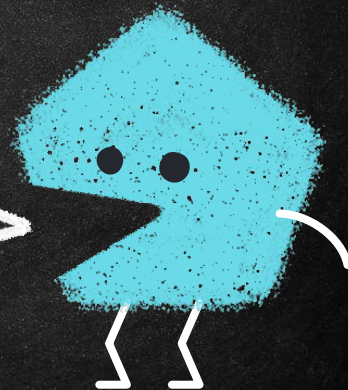
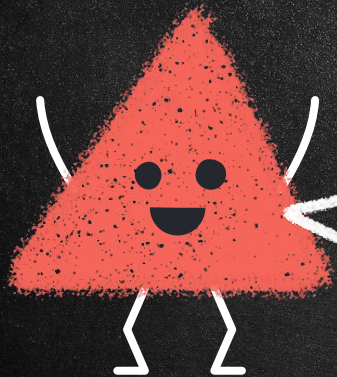




# HOW?

## 1. PREWORK PART 1

Use [Slide 9](#) for a differentiated  
intro to transformations





# TYPES OF TRANSFORMATIONS EXPLAINED

DIRECTIONS: CHOOSE A VIDEO TUTORIAL BASED ON YOUR GRADE BAND

## K-8

- [Mild](#)
- [Medium, translation + reflection](#)
- [Medium, dilation + rotation](#)
- [Spicy, dilation](#)
- [Spicy, translation](#)
- [Spicy, rotations](#)
- [Spicy, reflection](#)

## HS

- [intro to 3D transformations, general](#)
- [intro to 3D transformation matrices](#)
- [in depth, 3D transformation matrices](#)

## SUPPLEMENTAL

- [better resource but comparable to z's first link](#)  
(note Highlight ones z did in earlier resource)

# HOW

WILL WE LEARN ABOUT TRANSFORMATIONS??





# WHAT IS AFRAME?!

[LINK TO SITE](#)

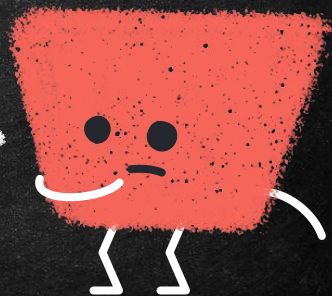
- web framework for building VR experiences
- based on html so can be developed on an html file

## VIRTUAL REALITY

- Combines hardware & software
- Let's the user interact in an immersive way

## WHY AFRAME?

- low learning curve if familiar w/ html/CSS/javascript
- Easy way to begin building VR graphics





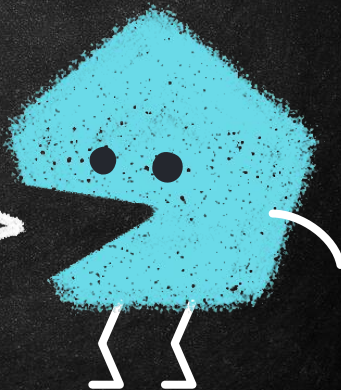
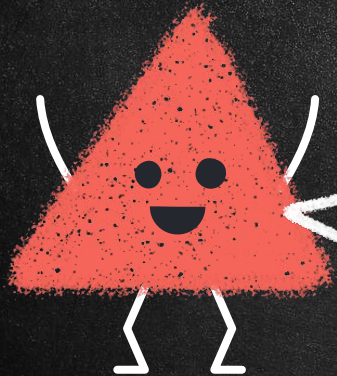
# HOW

WILL WE LEARN ABOUT  
AFRAME?

## 2. PREWORK PART 2

Use slide 10 to:

- ❑ Watch an **intro to AFrame**
- ❑ **Fork the provided replit** to begin creating 3D graphics
- ❑ **Do various Practice Tasks** to begin transforming them
- ❑ Use **reference slides** if need support



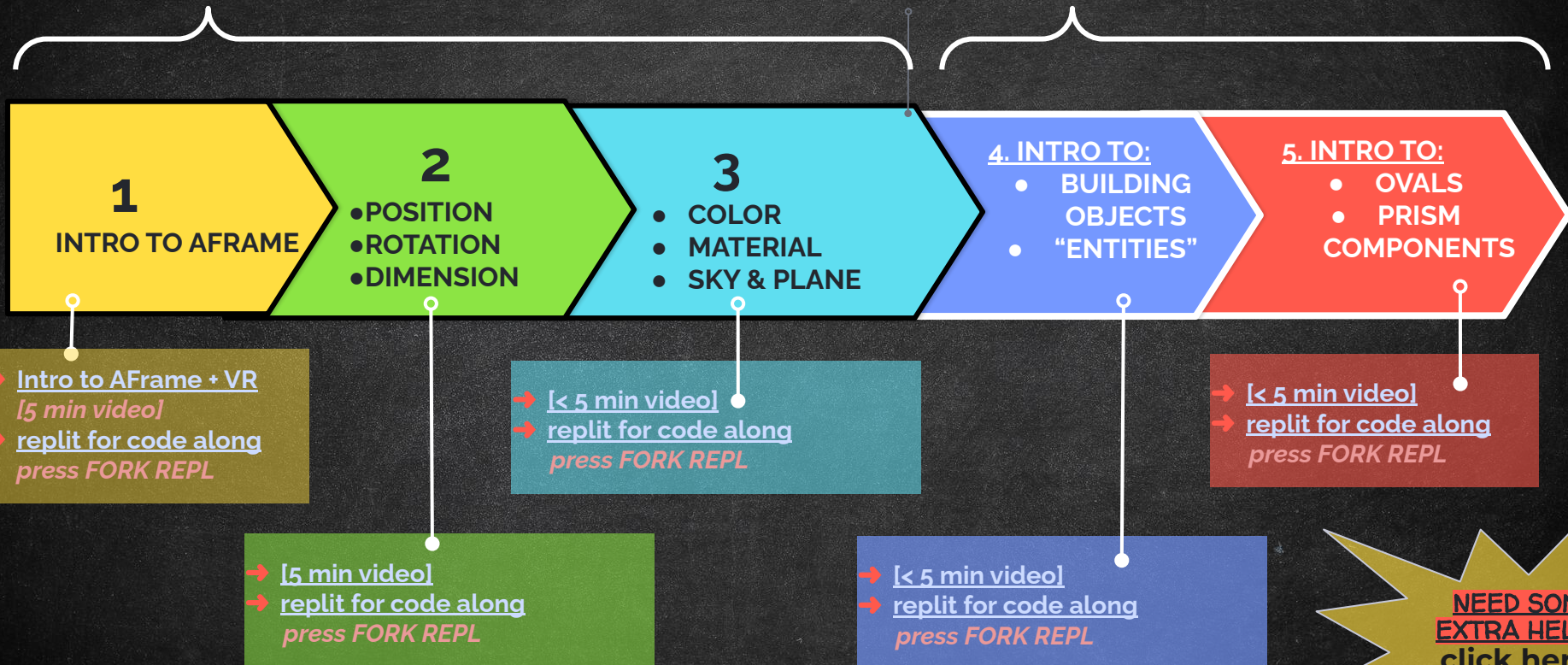


# AFRAME PRACTICE + REFERENCE SLIDE

10

DO THIS!

OPTIONAL DEEP DIVE!







## LOOKING AHEAD (THE “SO WHY...” )

**Positioning objects:** Transformations can be used to position objects in 3D space. This allows you to place objects wherever you want them in a scene, creating a more complex and realistic environment.

**Orientation:** Transformations can be used to rotate objects, which is important for creating the correct orientation of objects in the 3D space.

**Scaling:** Transformations can be used to scale objects to different sizes, which is important for creating realistic-looking objects in the 3D space.

**Animation:** Transformations can be used to create animations, where objects move, rotate, or scale over time. This is an essential part of creating interactive 3D graphics, such as in video games or virtual reality applications.

**Camera movement:** Transformations can be used to move the camera in a 3D scene. This allows you to change the perspective of the viewer, creating more interesting and engaging visual experiences.

