Animations in VR

Advance Web Development

Time: 60 mins

Introduction

In this class, the student/s will learn to animate the environment, mountains, stones and Jack's run.

JavaScript Commands & DOM Methods Introduced

● animation = "property: position; from: 0 0 0; to: 0 0 50;"	Sets the animation property to position and defines its starting and ending position
● animation = "property: rotation; from: 0 -10 0; to: 0 10 0;"	Sets the animation property to rotation and defines its starting and ending angles along axes for rotation
● animation = "easing: linear"	Smoothens the transition for the animation
● animation = "loop: true"	Repeats the animation in loop
● animation = "dur: 5000"	Completes 1 animation in 5000 milliseconds

Vocabulary

- **3D Animation** creates an illusion of objects moving through a 3D space.
- **VR rotation property** defines the angle of rotation along the x, y and z axis in anticlockwise direction for positive values and clockwise direction for negative values.

Learning Objectives

Student/s should be able to:

- ***Recall*** the position property.
- ***Explain*** the smooth animations in VR.
- ***Explain*** animations with rotation property.
- ***Animate*** environment, mountains, stones and Jack.

Activities

1. **Class Narrative:** *(2 mins)*

- Recall the student/s that they created an environment and placed Zonan in it.
- Tell them the story of why we need animation for the Mountain Surfer game.

2. **Concept Introduction Activity:** *(5 mins)*
   - Let the student/s play the explore-activity and observe Jack escaping the poacher .
   - Explain to the student/s how we can add animations to the Mountain Surfer game.
   - Using the slides, explain how to:
     - Animate Game Environment and Mountains
     - Animate the stones
     - Animate Jack's Run Animation

3. **Activity 1: Animate Game Environment and Mountains:** *(12 mins)*

   Teacher Activity: *(6 mins)*
   - Make the student/s observe that the trees and mountains should move backwards for the run animation effect.
   - Introduce pre-defined A-Frame properties for animating entities in the VR game.
   - Explain how to animate the trees from a forest environment using the animation component and setting the properties of A-Frame.

   Student Activity: *(6 mins)*
   - Guide the student/s to move backwards the mountains to the left and right of the scene.

4. **Activity 2: Animate the stones:** *(5 mins)*

   Student Activity: *(5 mins)*
   - Highlight to the student/s the movement of the stones.
   - Guide the student/s to animate the stones.

   Probing question: Which axis should the stones be moved along?
   Expected answer: Stones should be moved along the positive z-axis.

5. **Activity 3: Animate Jack's Run Animation:** *(15 mins)*

   Teacher Activity: *(6 mins)*
   - Let the student/s observe the movement of the parts of Jack's body.
   - Explain how to animate Jack's head and body.

   Student Activity: *(7 mins)*
   - Guide the students to animate Jack's limbs.
   - Guide students to ember the Mountain Surfer game within the VR Gamers website using iframe.

6. **Introduce the Post class project:** *(2 min)*
   - Animate the targets to move around and animate the bullet towards the target.

7. **Test and Summarize the class learnings:** *(5 mins)*
   - Check for understanding through quizzes and summarize learning after respective missions.
   - Summarize the overall class learning towards the end of the class.

8. **Additional activities:**

- Encourage the student/s to add animation to move the pendulum as shown.
- Encourage the student/s to animate the character to move forward in loop.

9. **State the Next Class Objective:** *(1 min)*
    - We will learn to create apps with react native.

U.S. Standards:

CSTA: 2-AP-11, 2-AP-12, 2-AP-13, 2-AP-14, 2-AP-19

Links Table		
Activity	**Activity Name**	**Link**
Class Presentation	Animations in VR	https://s3-whjr-curriculum-uploads.whjr.online/245d516c-b0a7-4006-9804-662277837bde.html
Explore Activity	Animations in VR: Explore-activity link	https://tynker.com/code/view/63dceca038ade45b39591542/
Teacher Activity 1	Animate the Environment	https://tynker.com/code/project/63dcf864d4a14d084b5ec762
Teacher Activity 1 Solution	Animate the Environment - Solution	https://tynker.com/code/project/63dcf81465f8f918ab1a0742
Student Activity 1	Animate the Mountains	https://tynker.com/code/project/63e4dd9539abd214336730e2
Teacher Reference: Student Activity 1 Solution	Animate the Mountains - Solution	https://tynker.com/code/project/63dcf6ed0db4dc5c3a3f8062
Student Activity 2	Animate the Stones	https://tynker.com/code/project/63e4e05534ebd2363e625807
Teacher Reference: Student Activity 2 Solution	Animate the Stones - Solution	https://tynker.com/code/project/63dcf5ade1f0636cf03dae62
Teacher Activity 3	Animate the Head and Body	https://tynker.com/code/project/63dcf4b54aa12e34ba36a1e2
Teacher Activity 3 Solution	Animate the Head and Body - Solution	https://tynker.com/code/project/63dcf4456ad1f1730453c967
Student Activity 3.1	Animate Jack's Run Animation	https://tynker.com/code/project/63e4e11843c96875e63c1392
Teacher Reference: Student Activity 3.1 Solution	Animate Jack's Run Animation - Solution	https://tynker.com/code/project/63dceca038ade45b39591542
Student Activity 3.2	Embed Games to the Website	https://tynker.com/code/project/63e4e18576135f488374aa62

Teacher Reference: Student Activity 3.2 Solution	Embed Games to the Website	https://tynker.com/code/project/63dce6f6c62b9a534b2d61f2
Student's Additional Activity 1	Animate the Pendulum	https://tynker.com/code/project/63e4e27ae0d04115a81b1e42
Teacher Reference: Student's Additional Activity 1 Solution	Animate the Pendulum - Solution	https://tynker.com/code/project/63db6646ff139867954afbc2
Student's Additional Activity 2	Animate the Character	https://tynker.com/code/project/63e4e270668c8144b205dbb2
Teacher Reference: Student's Additional Activity 2 Solution	Animate the Character - Solution	https://tynker.com/code/project/63db615a1c83962861622de2
Post Class Project	Animate the Bullets and Targets	https://tynker.com/code/project/63dc8e1d301e6131fd296352
Teacher Reference: Post Class Project Solution	Animate the Bullets and Targets - Solution	https://tynker.com/code/project/63dc8b399fcc0b09337c3c82