Topic	WRAPPING UP VR	
Class Description	**Students will revise the Virtual reality (VR) concepts they have learned during the module.**	
Class	**C186**	
Class time	**45 mins**	
Goal	• Revise the virtual reality concepts.	

Resources Required	• Teacher Resources:
	  ○ Visual Studio Code Editor
	  ○ laptop with internet connectivity
	  ○ smartphone
	  ○ earphones with mic
	  ○ notebook and pen
	• Student Resources:
	  ○ Visual Studio Code Editor
	  ○ laptop with internet connectivity
	  ○ smartphone
	  ○ earphones with mic
	  ○ notebook and pen	

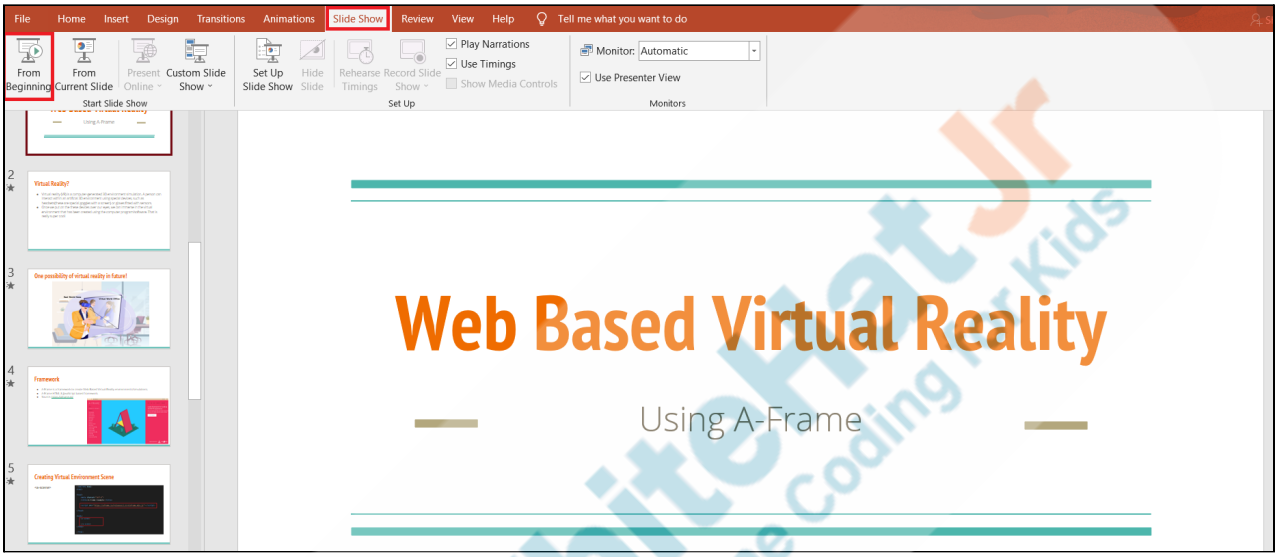
Class structure	**Warm-Up** **Teacher-led Activity** **Student-led Activity** **Wrap-Up**	**5 mins** **15 mins** **20 mins** **5 mins**
WARM-UP SESSION - 5 mins		
CONTEXT • **Revising VR Concepts.**		
Teacher Starts Slideshow 		

Slide 1 to 3 Refer to speaker notes and follow the instructions on each slide.	
Hey <student's name>. How are you? It's great to see you! Are you excited to learn something new today? **Following are the WARM-UP session deliverables:** • Greet the student. • Revision of previous class activities.	**ESR**: Hi, thanks! Yes I am excited about it! Click on the slide show tab and present the slides
WARM-UP QUIZ Click on In-Class Quiz	
Continue WARM-UP Session **Slide 4 to 33** 	
Following are the session deliverables: • Appreciate the student. • Narrate the story by using hand gestures and voice modulation methods to bring in more interest in students.	

Class Steps	Teacher Action	Student Action
Step 1: Warm-Up (5 mins)	Hi, how are you? Great!	**ESR:** I am good!
	Can you tell me what we have learned in the previous class? Great!	**ESR:** • We finished the face regorinition app by adding the first page using the stack navigation component from react.

	In today's class we will walk through the virtual reality concepts that we have covered in this module. Are you excited? Let's get started then.	**ESR**: Yes.
Teacher Ends Slideshow 		
TEACHER-LED ACTIVITY - 15 mins		
Teacher Initiates Screen Share		
CHALLENGE • **Revising VR Concepts.**		
Step 2: Teacher-led Activity (15 mins)	*<The teacher downloads the presentation file from Teacher Activity 1.>* ***[Teacher Activity 1]*** Before we can begin, can you tell me what all **projects** we have done **in virtual reality**? • *Open and start the presentation by clicking on the "**Slide Show**" button.* • *Use left/right arrow keys to move to the next/previous slide.*	**ESR**: Varied.

- *Share your screen during the Slide show and discuss the concepts along with it. Help the students to recollect and help them answer on their own.*



Discuss each concept using the slides:

- What is Virtual reality?
- What is A-Frame?
- How scenes are created?
- A-Frame Camera.
- A-Frame ECS architecture.
- A-Frame predefined components such as:
  - Geometry
  - Position
  - Rotation
  - Scale
  - Lights & types of lights
  - Animation
  - For gLTF and obj models
- A-Frame custom components

	• A-Frame primitives. • Navigation meshes • 3D Physics Engine ***Note**: Ask Questions & Encourage the student to give answers on their own.* *Help them recollect where they have used these concepts in the module.* Now that we have revised the concepts, let's quickly use one predefined component to create a firework burst effect(that we just saw in the last slide). Are you excited?	**ESR**: Yes!
Teacher Stops Screen Share		
	Now it's your turn. Please share your screen with me.	
Teacher Starts Slideshow  **Slide 34 to 35** Refer to speaker notes and follow the instructions on each slide.		
We have one more class challenge for you. Can you solve it? Let's try. I will guide you through it.		
Teacher Ends Slideshow 		
STUDENT-LED ACTIVITY - 20 mins		

- **Ask the student to press the ESC key to come back to the panel.**
- **Guide the student to start screen share.**
- **Teacher gets into fullscreen.**

ACTIVITY

- **Creating a firework burst using a predefined A-Frame component.**

Step 3: Student-led Activity (20 mins)	*Guide the student to create an HTML file and set up the A-Frame project.*	
	Guide the student to set the basic A-Frame scene.	

```
<!DOCTYPE html>
<html>

<head>

    <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>


</head>

<body>
    <a-scene id="scene">


        <a-sky color="#000000"></a-sky>

        <a-camera position="0 0 50"></a-camera>
    </a-scene>
</body>

</html>
```

	A **particle system** is a technique in game physics, motion graphics, and	

	computer graphics that uses many minute sprites, 3D models, or other graphic objects to simulate certain kinds of "fuzzy" phenomena, which are otherwise very hard to reproduce with conventional rendering techniques. *Guide the student to add the library link for the **aframe-spe-particles-component**.* *[Student Activity 1]* ***Link:*** ***https://unpkg.com/aframe-spe-particles-component@^1.0.4/dist/aframe-spe-particles-component.min.js***	

```
<head>
    <script src="https://aframe.io/releases/1.0.4/aframe.min.js"></script>
    <script src="https://unpkg.com/aframe-spe-particles-component@^1.0.4/dist/aframe-spe-particles-component.min.js"></script>
</head>
```

	*Guide the student to add the **entity** and attach the **spe-particles** component.*	

```
<a-entity position="0 1 0 " spe-particles="    ">
</a-entity>
```

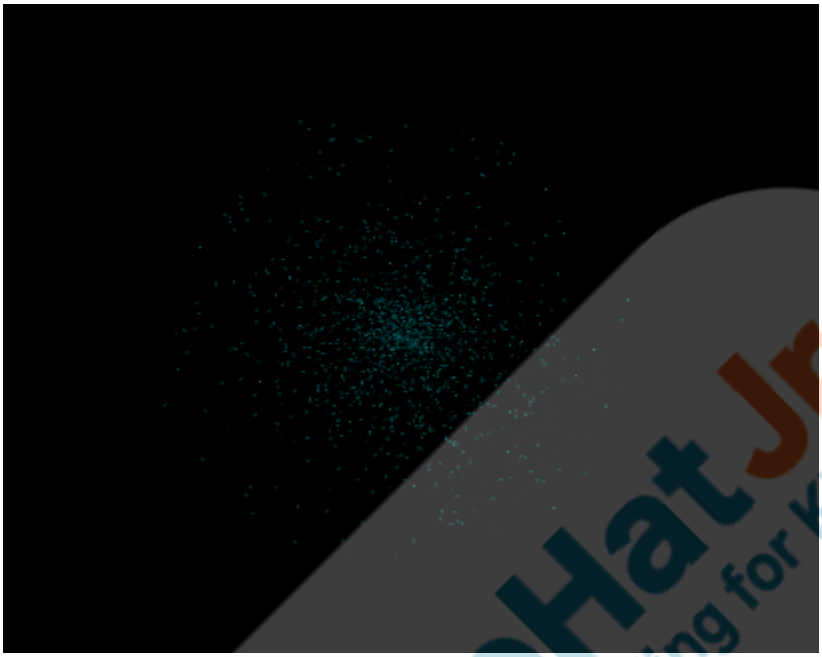
	There are many properties that can be set for this component, but we will set a few and test the output:	

	• **color**: list of colors for the particles; • **distribution**: shape of particles distribution; • **randomize-velocity**: whether to set the random velocity of the particles or not; • **radius**: radius of the shape of the distribution; • **particle-count**: number of particles; • **velocity**: velocity of the particles; • **velocity-spread**: how far the velocity must be spread before becoming zero; • **drag**: to apply resistance on the moving particles(between 0,no resistance and 1, full resistance); • **max-age**: age of the particle before reusing it; • **duration**: duration (in seconds) of emitting particles that how long the particles will keep emitting, to emit particles continuously value has to be less than 0; • **blending**: how the particles must blend in while created; • **active-multiplier**: to increase the rate of emission of particles; • **size**: list of numbers(max 4 in the list) to set the size of the particles	

	Guide the student to write the properties of the component: • *color: yellow, red, cyan, black;* • *distribution: sphere;* • *randomize-velocity: true;* • *radius: 1;* • *particle-count: 800;* • *velocity: 1;* • *velocity-spread: 15;* • *drag: 1;* • *max-age: 2;* • *duration: -1,* • *blending: additive;* • *active-multiplier: 1000;* • *size: 1, 1, 1, 0"*	

```
<a-entity position="0 1 0 " spe-particles="
color: yellow, red, cyan, black;
distribution: sphere;
randomize-velocity: true;
radius: 1;
particle-count: 800;
velocity: 1;
velocity-spread: 15;
drag: 1;
max-age: 2;
duration: -1,
blending: additive;
active-multiplier: 1000;
size: 1, 1, 1, 0">
</a-entity>
```

	Guide the student to test the output.	



Teacher Guides Student to Stop Screen Share

WRAP UP SESSION - 5 mins

WhiteHat Jr
Live online Coding for Kids

Teacher Starts Slideshow
Slide 36 to 40

Activity details

Following are the WRAP-UP session deliverables:

- Appreciate the student.
- Revise the current class activities.
- Discuss the quizzes.

WRAP-UP QUIZ
Click on In-Class Quiz

Continue WRAP-UP Session
Slide 41 to 46

Activity Details

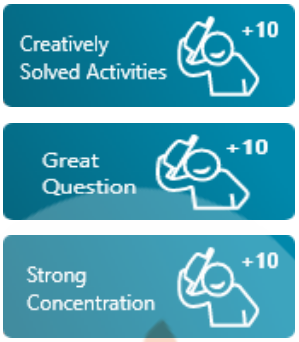
Following are the session deliverables:

- Explain the facts and trivia
- Next class challenge
- Project for the day
- Additional Activity (Optional)

FEEDBACK

- **Appreciate and compliment the student for trying to learn a difficult concept.**
- **Get to know how they are feeling after the session.**
- **Review and check their understanding.**

Teacher Action	Student Action
You get Hats off for your excellent work!	*Make sure you have given at least 2 Hats Off during the class for:*

	
PROJECT OVERVIEW DISCUSSION Refer the document below in Activity Links Sections	
Teacher Clicks 	

Additional Activities	*Encourage the student to write reflection notes in their reflection journal using markdown.*
	
	Use these as guiding questions:
	• What happened today?
	  ○ Describe what happened.
	  ○ The code I wrote.
	• How did I feel after the class?
	• What have I learned about programming and developing games?
	• What aspects of the class helped me? What did I find difficult?
		The student uses the markdown editor to write their reflections in a reflection journal.

Activity	Activity Name	Links
Teacher Activity 1	Slide Show PPT File.	Wrapping Up Web VR
Teacher Activity 2	Reference Code	https://github.com/whitehatjr/PRO-C186-Code-Ref

Teacher Activity 3	Output Reference	https://s3-whjr-v2-prod-bucket.whjr.online/fc80aae2-54b3-4dcc-a831-33ca1f0b3c52.gif
Student Activity 1	SPE Particle System Link	https://unpkg.com/aframe-spe-particles-component@^1.0.4/dist/aframe-spe-particles-component.min.js
Teacher Reference 1	Project Document	https://s3-whjr-curriculum-uploads.whjr.online/c9156e32-7a7a-499f-8acb-ba3e51f1fd26.pdf
Teacher Reference 2	Visual-Aid	https://s3-whjr-curriculum-uploads.whjr.online/784319b3-9d7d-46e6-9563-df81f6d9704e.html
Teacher Reference 3	In-Class Quiz	https://s3-whjr-curriculum-uploads.whjr.online/c6c24b81-f330-483c-b98d-da982b5babe5.pdf