



Using Augmented Reality (AR) Simulations with NCCER Core 6e



What is augmented reality (AR)?

Augmented reality (AR) is technology that enhances or *augments* your experience of the world around you.

AR is the rendering of digital images or data onto real-world objects. It integrates and adds value to your interaction with the real world.

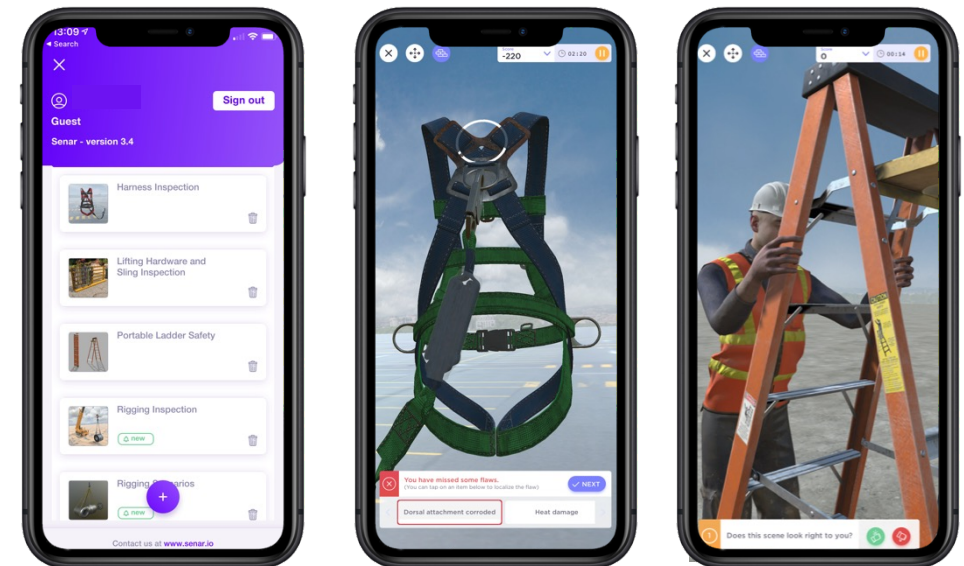
AR is increasingly used in construction for tasks such as project planning, field measurements, on-site project information, and safety training.



Using AR simulators with NCCER Core 6e

NCCER has partnered with **SENAR** to include access to AR simulators as part of your Core 6e training experience. You have access to five AR simulators:

- Harness Inspection
- Portable Ladder Safety
- Lifting Hardware and Sling Inspection
- Rigging Inspection
- Rigging: Audit of Load



Using AR simulators with NCCER Core 6e

With Core, you have access to five AR simulators that align with performance objectives in two of the course modules:

- **Module 00101, Basic Safety**
 - Harness Inspection
 - Portable Ladder Safety
- **Module 00106, Introduction to Basic Rigging**
 - Lifting Hardware and Sling Inspection
 - Rigging Inspection
 - Rigging: Audit of Load



Getting Started with SENAR

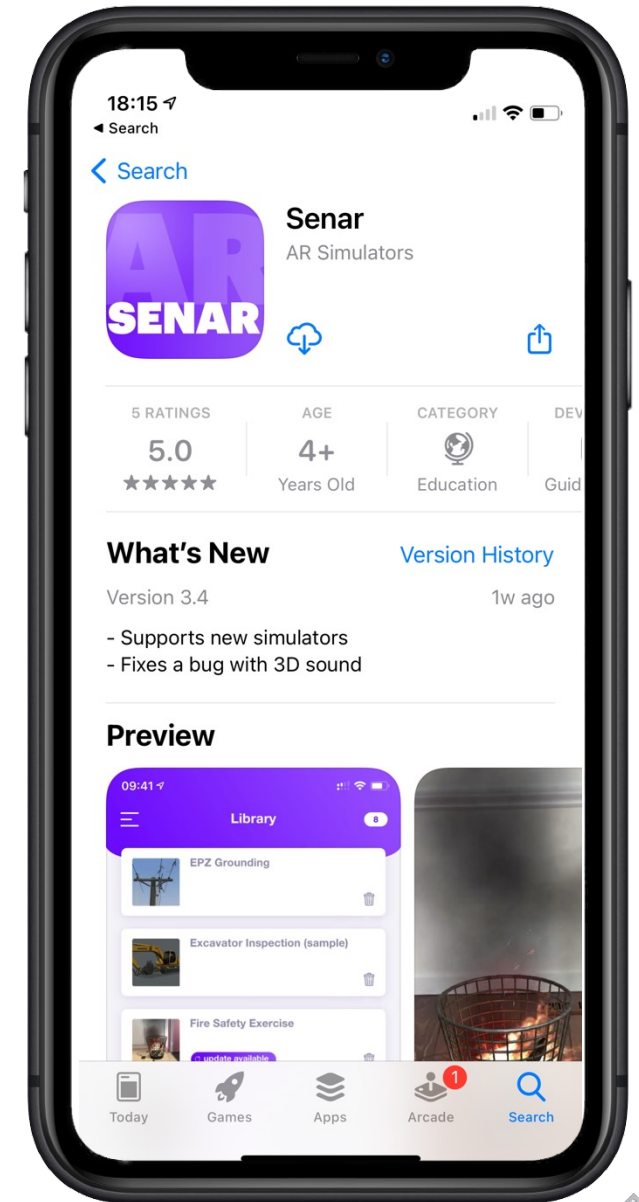
Download, Install, and Set Up the SENAR Application

Download and install the SENAR app

As a first step, **download and install the SENAR app** from the Apple App Store or Google Play.

The application works on both Apple iOS and Android devices and is generally compatible with devices from 2017 or later. For a complete list of compatible devices, click [here](#).

After the app is installed, **open the SENAR app on your device.**

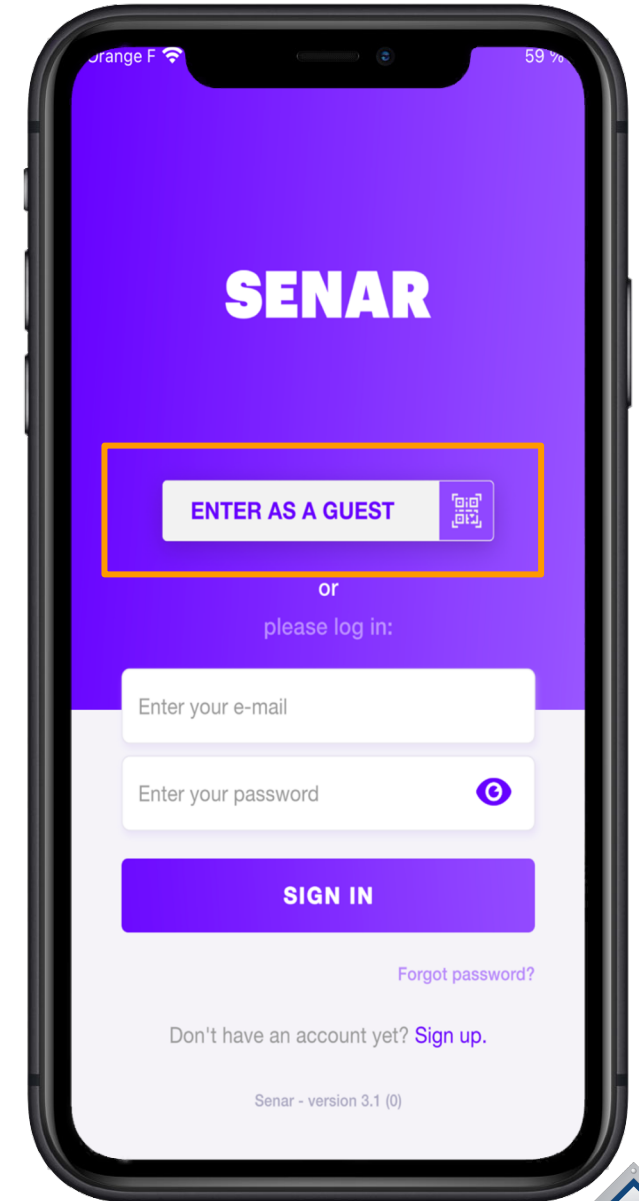


Log into the SENAR app

The first time you open the SENAR app, you will be prompted to log in *or* enter as a guest.

Click the **ENTER AS A GUEST** button to proceed.

If prompted, give the SENAR app the ability to access your camera. You will need this in the next step.



Scan the QR code

Next, you will need to **use the SENAR app to scan the QR code** at right.

Scanning this code will allow you to access the NCCER Core AR Simulator library.

Note: you must scan this using the SENAR app.

To start a training session, scan this code using the SENAR app.



NCCER Core Digital Resources

NCCER Simulations

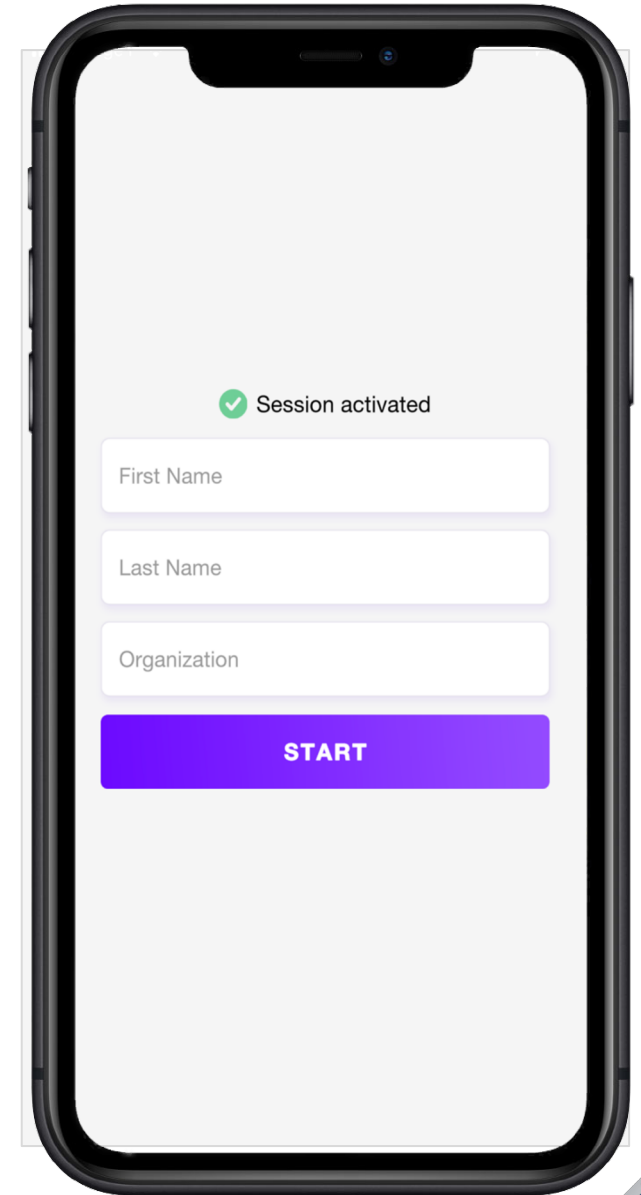


Set up your profile

Enter your **first name**, **last name**, and **organization** in the next screen. (If you're not sure of your organization name, just enter NCCER).

As long as you stay logged in, you will only have to do this step one time.

Click the **START button** to access the library screen.



The image shows a smartphone screen displaying a profile setup form. At the top, there is a green checkmark icon followed by the text "Session activated". Below this, there are three input fields: "First Name", "Last Name", and "Organization". At the bottom of the form is a prominent purple button with the word "START" in white capital letters.

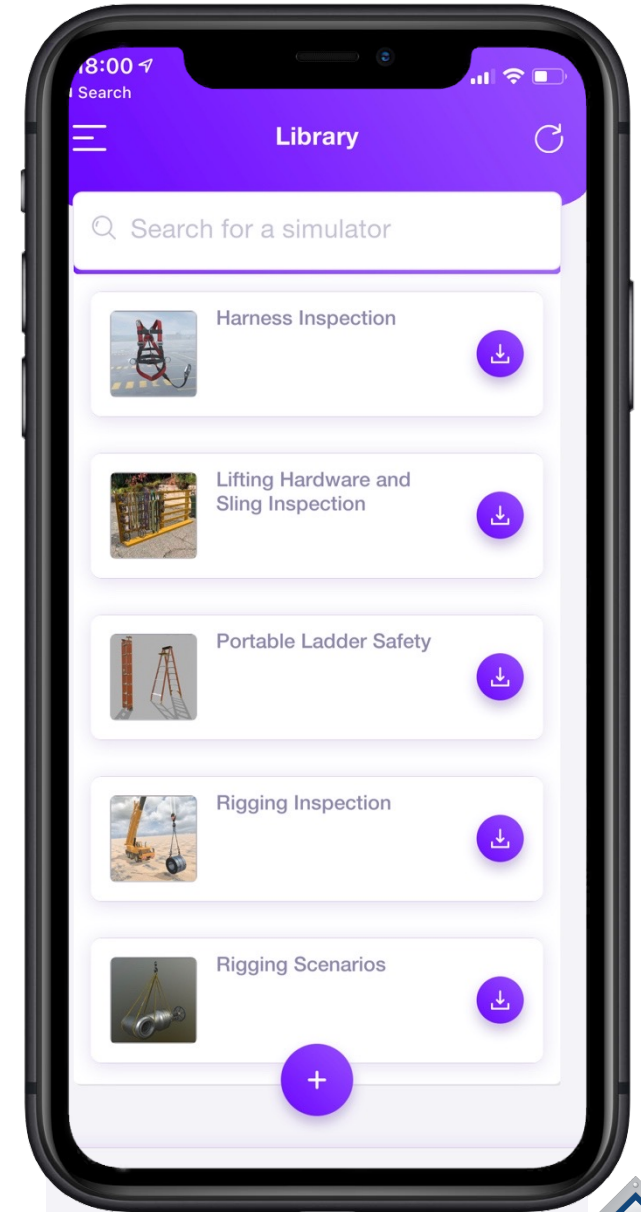


Download the AR simulators

After you have clicked START and logged in, you will want to download the simulators you wish to use.

You can download a simulator by tapping the **purple download button** next to its name.

Once downloaded, tap a **simulator's name** to launch it.



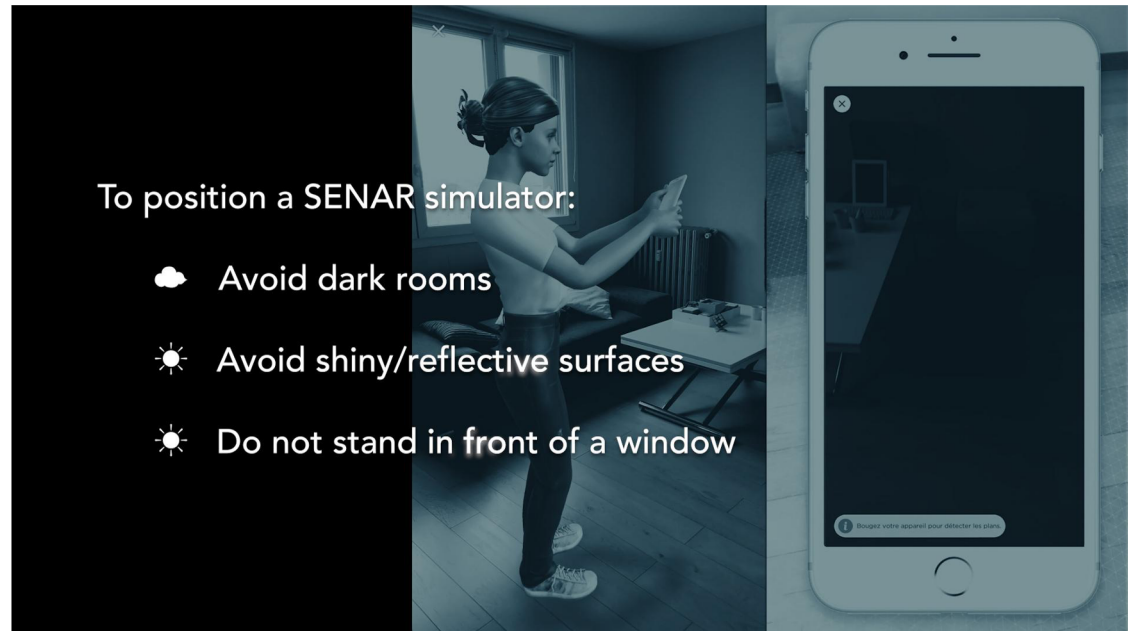
Position the AR simulators

Before you get started, you will need to position the simulator. The steps to position an AR simulator are simple.

1. First, **scan your environment** (walls, floor, furniture) for about 20 seconds.
2. Once the target is following your movements perfectly, **aim at the location** where you'd like to place the simulator.
3. Next, **tap the blue check mark** at the bottom right of your screen.

Want to learn more?

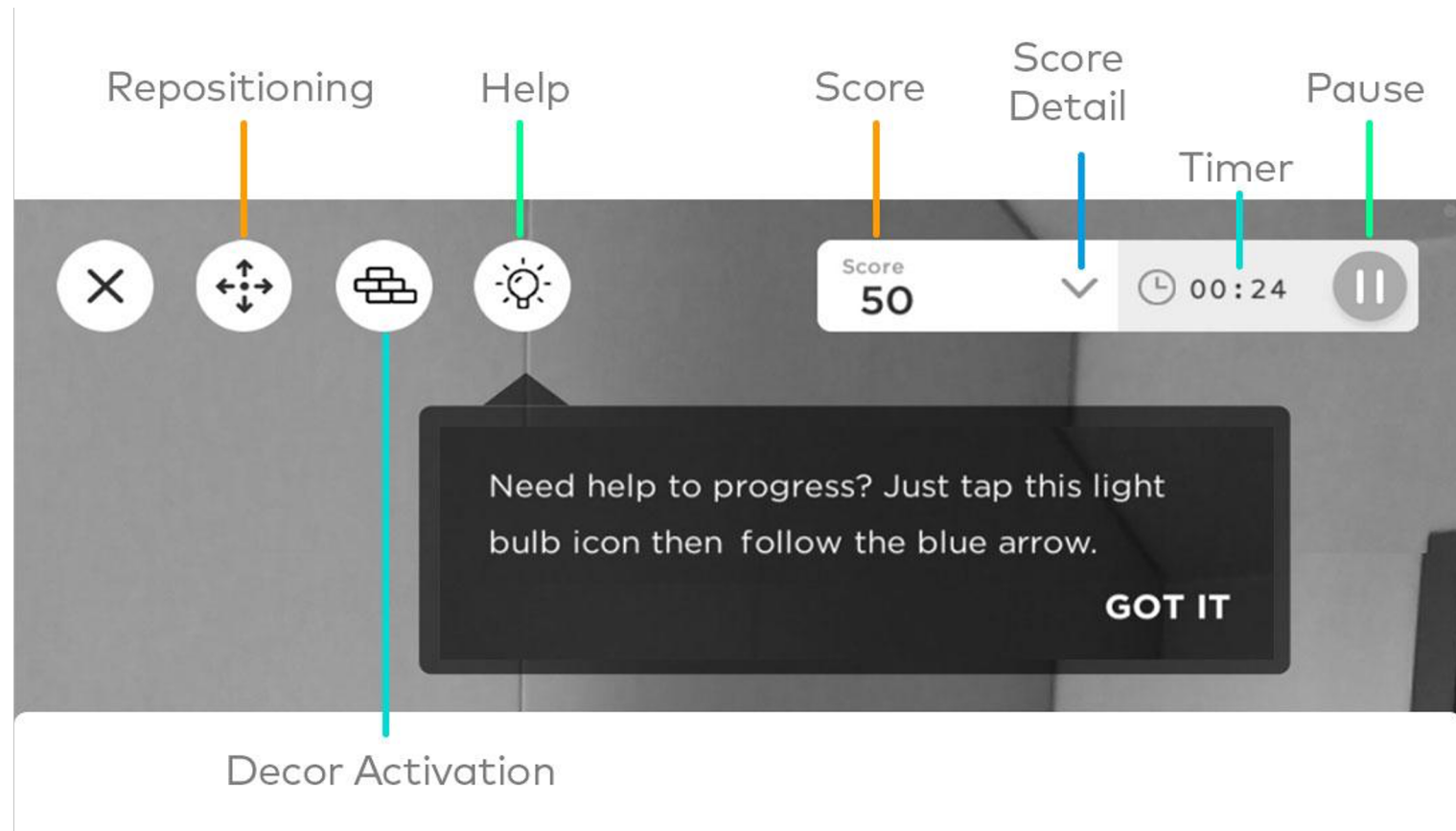
[Watch a video on how to position your AR simulation.](#)



Navigate in an AR simulator

Once positioned, the simulator is part of your environment: you can move around it as if it were a real object.

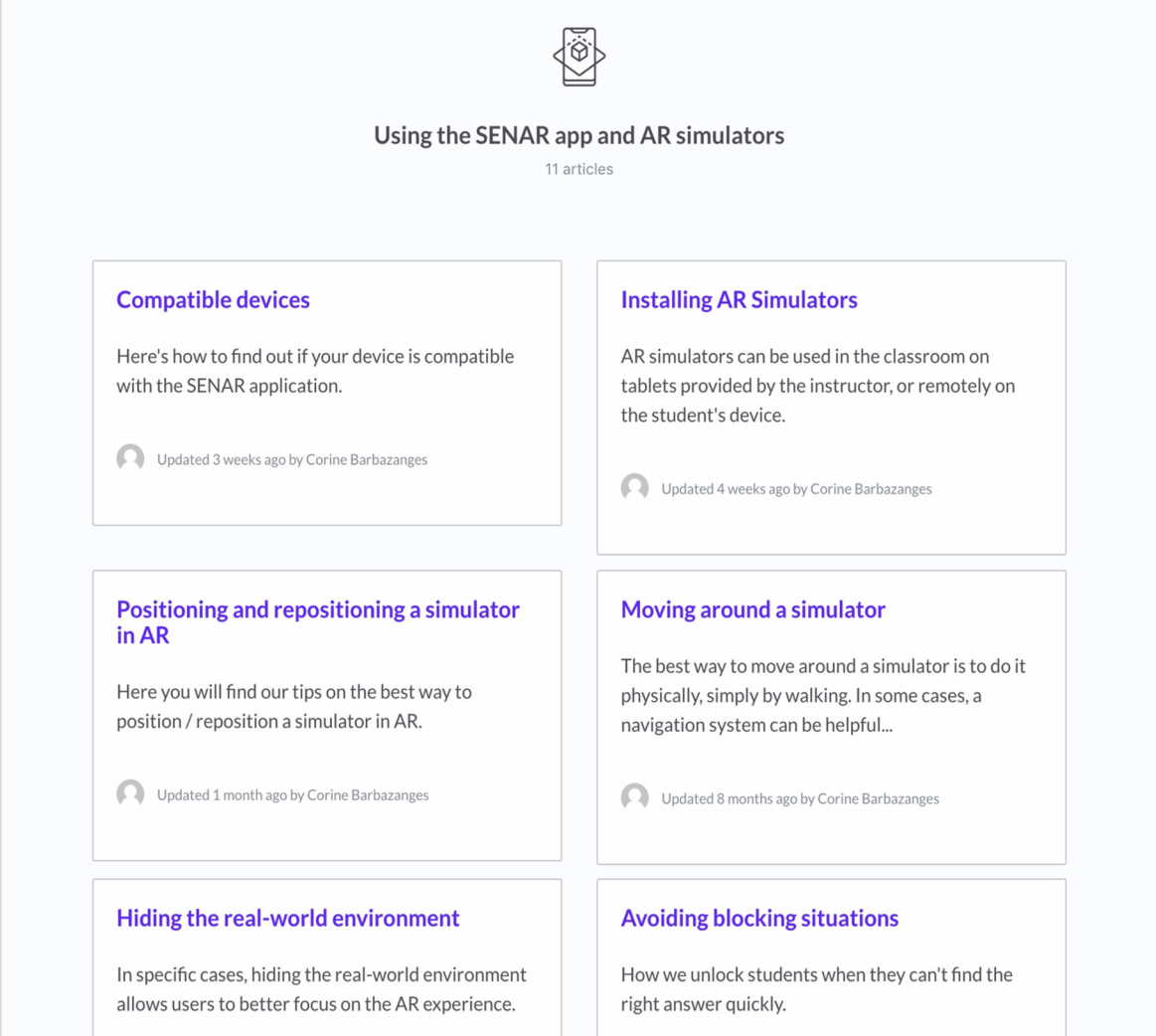
Note: not every AR simulator will have all of these buttons, depending on the functionality inside of the specific simulator.



Need more help?

SENAR has a rich collection of online help for trainees and instructors.

Check out SENAR online help via the [SENAR Knowledge Base.](#)



The screenshot displays a user interface for the SENAR Knowledge Base. At the top center, there is a mobile phone icon with a gear inside, representing the app. Below it, the title "Using the SENAR app and AR simulators" is displayed, followed by "11 articles". The main content area is a grid of six article cards. Each card has a title in purple, a brief description, and a small profile icon with the text "Updated [time] ago by Corine Barbazanges".

- Compatible devices**: Here's how to find out if your device is compatible with the SENAR application. Updated 3 weeks ago by Corine Barbazanges.
- Installing AR Simulators**: AR simulators can be used in the classroom on tablets provided by the instructor, or remotely on the student's device. Updated 4 weeks ago by Corine Barbazanges.
- Positioning and repositioning a simulator in AR**: Here you will find our tips on the best way to position / reposition a simulator in AR. Updated 1 month ago by Corine Barbazanges.
- Moving around a simulator**: The best way to move around a simulator is to do it physically, simply by walking. In some cases, a navigation system can be helpful... Updated 8 months ago by Corine Barbazanges.
- Hiding the real-world environment**: In specific cases, hiding the real-world environment allows users to better focus on the AR experience.
- Avoiding blocking situations**: How we unlock students when they can't find the right answer quickly.





Using AR simulators with Module 00101: Basic Safety

1. Harness Inspection AR Simulator
2. Portable Ladder Safety AR Simulator

Harness Inspection AR Simulator

This simulator allows trainees to inspect a series of different harnesses.

HARNESS

Your mission: Your job is to inspect a series of harnesses and identify if each is safe to use.

Trainees review harnesses for issues such as heat damage, corroded attachments, cracked or broken buckles, frayed or worn materials or stitching, and more.

- Trainees are asked to confirm if a harness is safe to use.
- Next, trainees will identify the specific flaws of each harness.
- Quick tips:
 - You can rotate the harness with your fingers to get closer to view flaws.
 - Not every harness has flaws.
 - Not every harness has the same number of flaws.
 - After ending the inspection, a trainee can tap on the name of the flaw to localize it on the harness.



Harness Inspection AR Simulator

Below are some ideas on how to use this AR simulator in your classroom.

HARNESS

Your mission: Your job is to inspect a series of harnesses and identify if each is safe to use.

Trainees review harnesses for issues such as heat damage, corroded attachments, cracked or broken buckles, frayed or worn materials or stitching, and more.

Before trainees use the simulator

Describe how to properly inspect a PFAS, directing them to Section 2.2.0 of the NCCER Core 6e Trainee Guide.

Play the [Altec - How to Properly Inspect a Safety Harness](#) video on YouTube. This video illustrates the proper steps to inspect and use a harness.

After trainees use the simulator

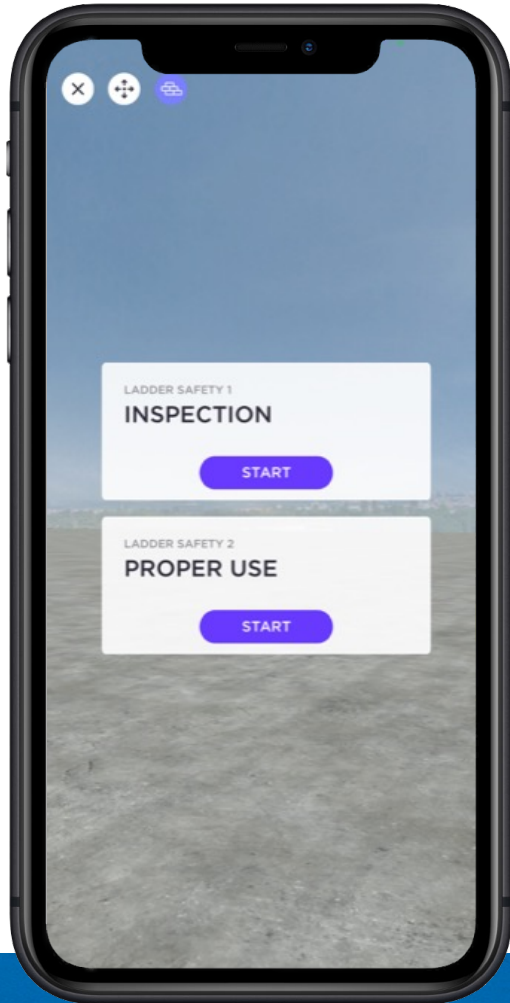
Have trainees share their experiences in the simulator. Prompt discussion with questions such as:

- What was your total score? Which harness had the highest score?
- Were any of the harnesses safe to use? Which color?
- Which of the harness flaws were hardest to identify? Why?
- Were any of the flaws ones you have personally seen?



Portable Ladder Safety AR Simulator

This simulator has two paths: **Inspection** and **Proper Use**.



INSPECTION

- **Your mission:** Your job is to inspect a series of 6 ladders and identify any potential hazards.
- Trainees review ladders for hazards such as bent or oily rungs, broken rung locks, frayed ropes, damaged shoes, missing end caps, and more.

PROPER USE

- **Your mission:** You must carefully inspect a series of 12 scenes and report any issues.
- Trainees review scenes to determine if they show proper ladder use and identify any safety issues.



Portable Ladder Safety Inspection AR Simulator

Below are some ideas on how to use this AR simulator in your classroom.

INSPECTION

- **Your mission: Your job is to inspect a series of 6 ladders and identify any potential hazards.**
- Trainees review ladders for hazards such as bent or oily rungs, broken rung locks, frayed ropes, damaged shoes, missing end caps, and more.

Before trainees use the simulator

Describe how to properly inspect a ladder, directing them to Section 2.3.0 of the NCCER Core 6e Trainee Guide.

Play the [Werner Ladder - Ladder Inspection](#) video on YouTube. This video illustrates the proper procedure for inspecting both step and extension ladders before use. This video offers good visual examples of damaged ladder components and will help the trainees become thorough and proficient at performing ladder inspections.

After trainees use the simulator

Have trainees share their experiences in the simulator. Prompt discussion with questions such as:

- What was your final score?
- Which of the hazards were hardest to identify? Why?
- Were any of the hazards unexpected?
- Have you experienced any of these in your work or training? How did you handle that situation?



Portable Ladder Safety Proper Use AR Simulator

Below are some ideas on how to use this AR simulator in your classroom.

PROPER USE

- **Your mission: You must carefully inspect a series of 12 scenes and report any issues.**
- Trainees review scenes to determine if they show proper ladder use and identify any safety issues.

Before trainees use the simulator:

Describe how to properly use a ladder, directing them to Section 2.3.0 of the NCCER Core 6e Trainee Guide.

Play the [How to Use Ladders Safely](#) video from This Old House on YouTube. This video illustrates how to select the proper ladder, secure a ladder, and move up and down a ladder. This video is long, at ten minutes, but it offers good visual examples of many types of ladders and the full range of usage.

After trainees use the simulator:

Have trainees share their experiences in the simulator. Prompt discussion with questions such as:

- How many of the scenes were correct? How many were incorrect?
- Which of the scenes showed a situation you have seen in your work or training?
- Which scenes were the most challenging to spot the issues?





Using AR simulators with Module 00106: Introduction to Basic Rigging

1. Lifting Hardware and Sling Inspection
2. Rigging Scenarios
3. Rigging Inspection

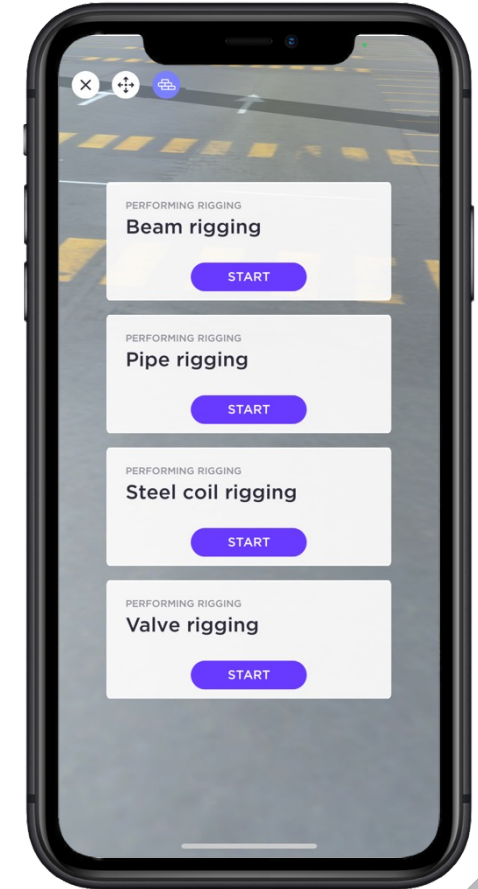
Rigging Scenarios AR Simulator

This simulator has trainees select the right rigging equipment for a series of different loads.

RIGGING SCENARIOS

- **Your mission:** You must carefully select the most efficient equipment on a rigging rack to move different material and equipment.
- Trainees have four paths to test their hand at beam rigging, pipe rigging, steel coil rigging, and valve rigging.

- Trainees are first presented with the job to properly move some materials or equipment. They must select the most efficient equipment from the rigging rack.
- Trainees then must determine the safest hitch type to use.
- **Quick tips:**
 - This may stretch trainees learning, but it will be fun!
 - If the trainee doesn't select all the needed equipment, the simulator will show the right choices.
 - After the equipment and hitch is selected, a trainee can watch the rigging in action.



Rigging Scenarios AR Simulator

Below are some ideas on how to use this AR simulator in your classroom.

RIGGING SCENARIOS

- **Your mission: You must carefully select the most efficient equipment on a rigging rack to move different material and equipment.**
- Trainees have four paths to test their hand at beam rigging, pipe rigging, steel coil rigging, and valve rigging.

Before trainees use the simulator

Ensure trainees have fully read Module 00106 Introduction to Basic Rigging in the NCCER Core 6e Trainee Guide. This simulation will broadly require much of their new knowledge on slings, hitches, and hoists.

After trainees use the simulator

Have trainees share their experiences in the simulator. Prompt discussion with questions such as:

- What was your highest and lowest scores for the rigging scenarios?
- Which of the rigging scenarios were the most complex to solve?
- Which scenario(s) used a basket hitch? [answer is in slide notes below]



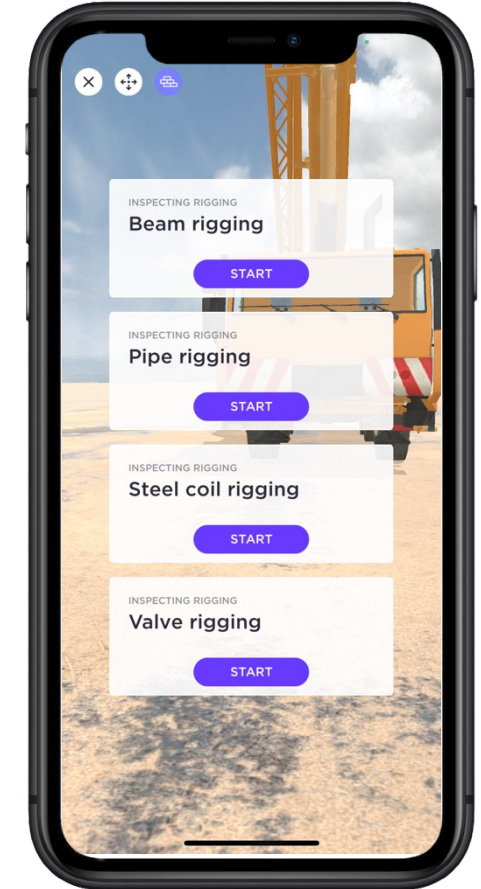
Rigging Inspection AR Simulator

This simulator has trainees inspect rigging equipment safety for a series of different loads.

RIGGING INSPECTION

- **Your mission:** You must carefully inspect the load and the way it is rigged to determine if the load is safe.
- Trainees have four paths to test their hand at beam rigging, pipe rigging, steel coil rigging, and valve rigging. Each path has multiple scenarios.

- This simulator has trainees inspect four different types of rigging equipment.
- Trainees are shown a load that is currently rigged.
- Trainees then must determine if the load is safe and, if not, select why not.
- **Quick tips:**
 - Some loads are safe, some are not.
 - After selecting the reason that a load is not safe, trainees can watch a fix to the rigging in action.



Rigging Inspection AR Simulator

Below are some ideas on how to use this AR simulator in your classroom.

RIGGING INSPECTION

- **Your mission: You must carefully select the most efficient equipment on a rigging rack to move different material and equipment.**
- Trainees have four paths to test their hand at beam rigging, pipe rigging, steel coil rigging, and valve rigging.

Before trainees use the simulator

Ensure trainees have fully read Module 00106 Introduction to Basic Rigging in the NCCER Core 6e Trainee Guide. This simulation will broadly require much of their new knowledge on slings, hitches, and hoists.

After trainees use the simulator

Have trainees share their experiences in the simulator. Prompt discussion with questions such as:

- What was your highest and lowest scores for the rigging inspection?
- Which of the rigging inspections took the longest to complete?
- Which was the easiest to understand?
- Did any of the issues you found surprise you?



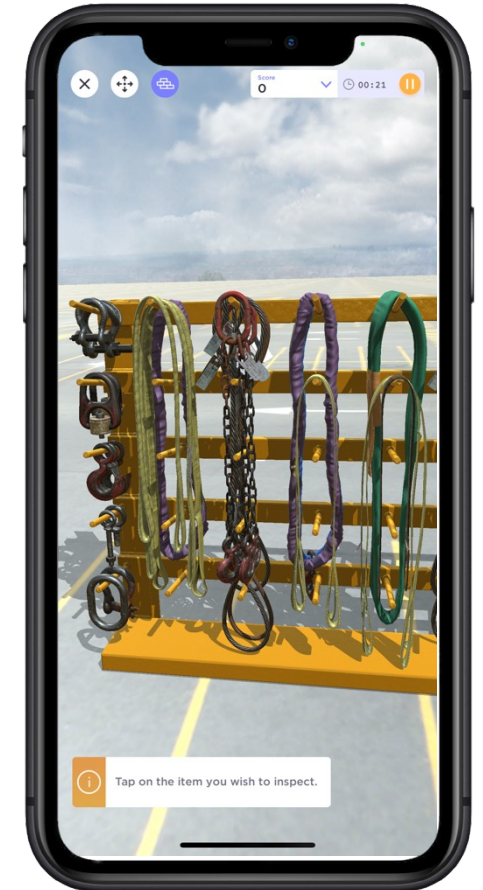
Lifting Hardware & Sling Inspection AR Simulator

This simulator has Levels 1 and 2 for trainees to inspect a series of lifting hardware and slings.

LIFTING HARDWARE & SLING INSPECTION

- **Your mission: You must select and inspect the slings and lifting hardware to determine if they are safe to use.**
- Trainees have two levels that last about 15 minutes to review a wide range of slings and hardware to look for flaws and issues.

- This simulator has trainees inspect many different types of lifting hardware and slings.
- Trainees can select these items in any order from a rack.
- Trainees then must determine if the lifting hardware and slings are safe.
- Quick tips:
 - Some of the lifting hardware is safe, some are not.
 - After you answer, a pulsing circle will point out potential flaws.



Lifting Hardware & Sling Inspection AR Simulator

Below are some ideas on how to use this AR simulator in your classroom.

LIFTING HARDWARE & SLING INSPECTION

- **Your mission: You must select and inspect the slings and lifting hardware to determine if they are safe to use.**
- Trainees have two levels that last 15-16 minutes to review a wide range of slings and hardware to look for flaws and issues.

Before trainees use the simulator

Ensure trainees have fully read Module 00106 Introduction to Basic Rigging in the NCCER Core 6e Trainee Guide with a focus on 1.2.0 Sling Inspection.

Play some selected How to Inspect to OSHA and ASME Standards videos on the [Lifting and Rigging YouTube channel](#).

After trainees use the simulator

Have trainees share their experiences in the simulator. Prompt discussion with questions such as:

- How long did it take you to complete the entire simulation?
- How many did you find that were safe? How many were not?
- Were there any flaws repeated on different pieces of lifting hardware or slings?
- Were there any flaws you had seen in other AR simulators?



Other learning tips for using AR simulators

Below are some additional ideas on how to engage with an AR simulator:

- **Explore and have fun.** Some of these simulators will be challenging, but it's a safe and fun way to practice and learn!
- Feeling stuck? **Use the NCCER Core 6e Trainee Guide as a reference** while in the simulator experience – or just ask a classmate.
- **Don't worry about scores or time.** These experiences are about learning!
- Engage fully with the simulator. **Stand up and move around** the objects, just as if they were real. Lean in to look for flaws or inspect tags and weights.
- **Take screenshots** while in the simulator to capture interesting things you find *or* scores and timers at the end of the simulation.





**Need support or help?
Contact SENAR at**

<https://support.senar.io>