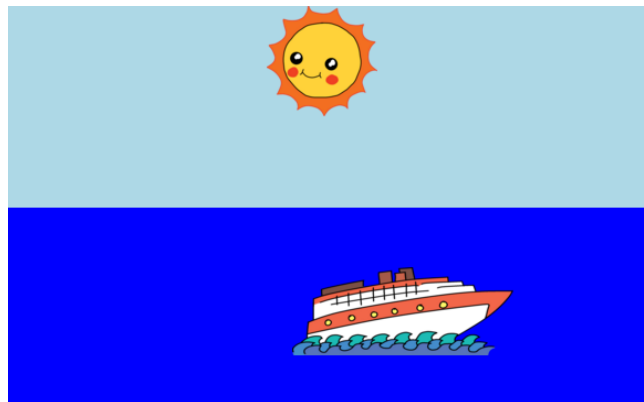# 🫐 Projects

---

Sunrise

Create an animated sunrise.

HTML / CSS

Step 1   **Introduction**

In this project, you'll learn how to use CSS to create an animated sunrise.

Additional information for club leaders

If you need to print this project, please use the **Printer friendly version (h ttps://projects.raspberrypi.org/en/projects/sunrise/print)**.

> ℹ️ **Club leader notes**
>
> **Introduction:**
>
> In this project, children will to learn how to animate a simple scene using CSS. They will use the CSS @keyframes rule to animate various properties of images and divs.
>
> **Online Resources**

We recommend using **trinket** **(https://trinket.io/)** to write HTML & CSS online. This project contains the following trinkets:

- **'Sunrise' starting point** **(https://trinket.io/html/web-sunrise)**

Children can also make use of this blank trinket **(jumpto.cc/html-blank)** **(http://jumpto.cc/html-blank)** to write their own HTML & CSS, or alternatively they can use this template trinket **(jumpto.cc/html-template)** **(http://jumpto.cc/html-template)**.

There is also a trinket containing a sample solution to the challenges:

- **'Sunrise' Finished** **(https://trinket.io/html/abcc0284a3)**

Offline Resources

This project can be **completed offline** **(../offline.html)** if preferred. You can access the project resources by clicking the 'Download Project Materials' link for this project. This link contains a 'Project Resources' folder, which includes resources that children will need to complete this project offline. Make sure that each child has access to a copy of these resources. This folder includes the following files:

- template/index.html
- template/prefix.js
- template/style.css
- sunrise/index.html
- sunrise/style.css
- sunrise/prefixfree.js
- sunrise/boat.png
- sunrise/cloud.png
- sunrise/helicopter.png
- sunrise/rainbow.png
- sunrise/sun.png

You can also find a completed version of this project's challenges in the 'Volunteer Resources' section, which contains:

- sunrise-finished/index.html
- sunrise-finished/style.css
- sunrise-finished/prefixfree.js
- sunrise-finished/boat.png
- sunrise-finished/sun.png

- sunrise-finished/rainbow.png

Learning Objectives

- Styling and animation with CSS:
    - Introducing `@keyframes` rule for defining steps in an animation.
    - Reinforcing the use of properties to define the size, shape, position and colour of elements on a webpage.

This project covers elements from the following strands of the **Raspberry Pi Digital Making Curriculum [(http://rpf.io/curriculum)](http://rpf.io/curriculum)**:

- **Design basic 2D and 3D assets [(https://www.raspberrypi.org/curriculum/design/creator)](https://www.raspberrypi.org/curriculum/design/creator)**.

Challenges

- "Diagonal animation" - editing animation `@keyframe` properties to use left:;
- "Improve the sky" - add more keyframes and setting background:.
- "More animation" - animate more images or elements using a variety of CSS properties.

Frequently Asked Questions

- This project makes use of the javascript `prefixfree.js` library, to allow animation compatibility between browsers. If this library isn't used, then children using older browsers will instead need to declare an animation for their browser, for example:

```
animation: sky 10s infinite;          //for all
newer browsers
-webkit-animation: sky 10s infinite;    // For
Webkit browsers(Chrome, Safari...)
-moz-animation: sky 10s infinite;       // For
Mozilla browsers
-o-animation: sky 10s infinite;         // For
Opera browsers
-ms-animation: sky 10s infinite;        // For
Microsoft browsers
```

ⓘ **Project materials**

Project resources

- **.zip file containing all project resources** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-project-resources.zip)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-project-resources.zip)
- **Online Trinket containing all 'Sunrise' project resources** [(http://jumpto.cc/web-sunrise)](http://jumpto.cc/web-sunrise)
- **Online Trinket template** [(http://jumpto.cc/trinket-template)](http://jumpto.cc/trinket-template)
- **Online blank Trinket** [(http://jumpto.cc/trinket-blank)](http://jumpto.cc/trinket-blank)
- **template/index.html** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/template-index.html)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/template-index.html)
- **template/style.css** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/template-style.css)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/template-style.css)
- **intro/index.html** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/intro-index.html)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/intro-index.html)
- **intro/style.css** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/intro-style.css)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/intro-style.css)
- **sunrise/index.html** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-index.html)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-index.html)
- **sunrise/style.css** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-style.css)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-style.css)
- **sunrise/prefixfree.js** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-prefixfree.js)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-prefixfree.js)
- **sunrise/sun.png** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-sun.png)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-sun.png)
- **sunrise/rainbow.png** [(https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-rainbow.png)](https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-rainbow.png)

- **sunrise/cloud.png** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-cloud.png)
- **sunrise/boat.png** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-boat.png)
- **sunrise/helicopter.png** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-helicopter.png)

Club leader resources

- **.zip file containing all completed project resources** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-volunteer-resources.zip)
- **Online completed Trinket project** (https://trinket.io/html/abcc0284a3)
- **sunrise-finished/index.html** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-finished-index.html)
- **sunrise-finished/style.css** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-finished-style.css)
- **sunrise-finished/prefixfree.js** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-finished-prefixfree.js)
- **sunrise-finished/sun.png** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-finished-sun.png)
- **sunrise-finished/boat.png** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-finished-boat.png)
- **sunrise-finished/rainbow.png** (https://projects-static.raspberrypi.org/projects/sunrise/d075496c05602b4047c302f4f37db8b65b739a45/en/resources/sunrise-finished-rainbow.png)

Step 2   Creating the sun

Let's start by adding an image for the sun and positioning it with some CSS.

- Open this trinket: **jumpto.cc/web-sunrise (http://jumpto.cc/web-sunrise)**.

  The project should look like this:
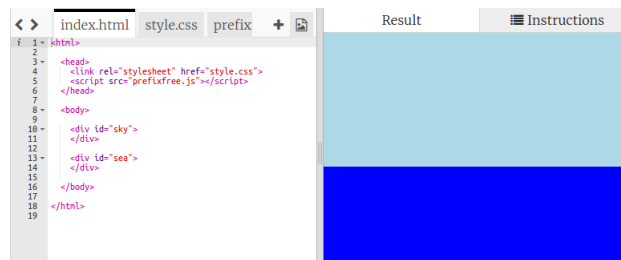
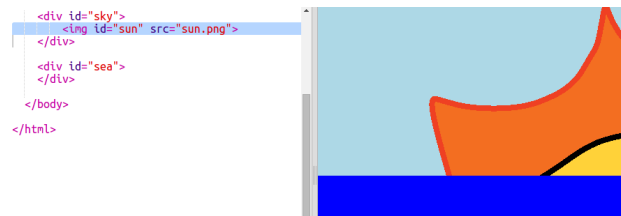- Look inside the `body` of your `index.html` file and you'll find the the `div` elements for the sky and the sea.
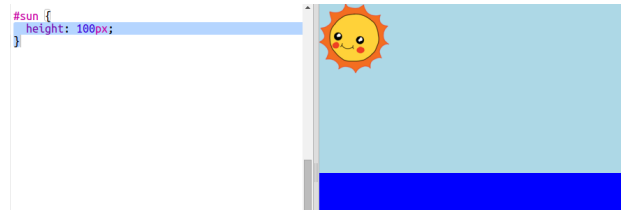
  ```
  <div id="sky">
  </div>

  <div id="sea">
  </div>
  ```

- An image for the sun is already included in your project.

  Add the image inside your sun `div` including an id so you can style it:

- Whoa, the image is huge. Go to `style.css` and add the CSS to set the image height:

Note that the width is updated automatically to keep the proportions the same.

- Finally, let's add some code to position the sun:
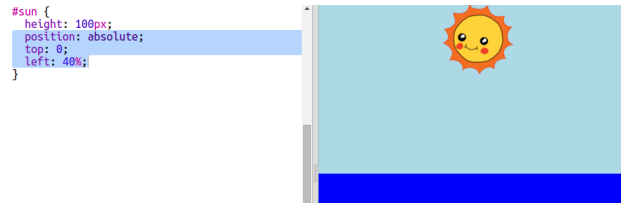
Step 3   Animating the sunrise

To animate your sunrise, you need to define how the sun moves and how long it takes to rise.

To do this you define a list of **key frames**. Each key frame defines the CSS properties of an element at a particular point in an animation.

- First, you need to use `@keyframes` to create a new animation called sunrise.

   Add this CSS code to the end of your `style.css` file:

```
@keyframes sunrise {
    0%
    100%
}
```

This code tells the sun where to position itself at the start (`0%`) and the end (`100%`) of the animation.

Because the sun is inside the sky `div`, the `top` and `left` positions you give are within to the sky, with `top: 100%` being the bottom of the sky, and not the bottom of the webpage.

- Now that you have created a `sunrise` animation, you just need to tell your sun to use it!

  Add the highlighted code to your sun's CSS:

  ```
  #sun {
      height: 100px;
      position: absolute;
      top: 0;
      left: 40%;
      animation: sunrise 10s;
  }

  @keyframes sunrise {
      0% {top: 90%;}
      100% {top: 0;}
  }
  ```
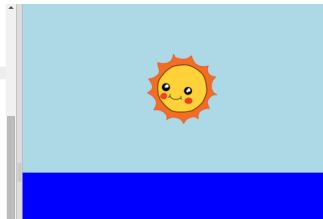
  This tells the sun to spend 10 seconds animating a sunrise.

- To run the animation again in Trinket, just click **Autorun**.

Step 4   Challenge: Diagonal animation

Can you add code to your `sunrise` animation, to make your sun start at the bottom left of the sky and move diagonally to its position at roughly the top center?

You can use the `left` property to do this, for example:

```
left: 40%;
```
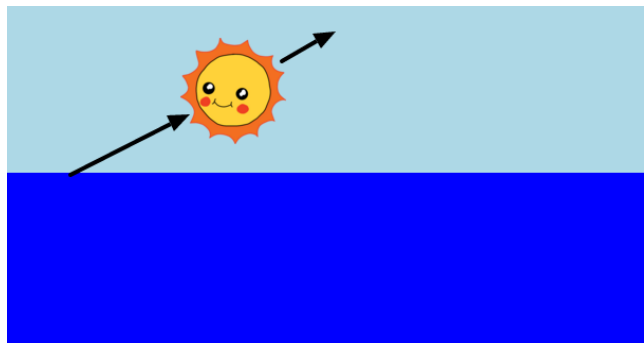
Step 5   **Infinite animation**

Let's make the animation keep repeating forever.
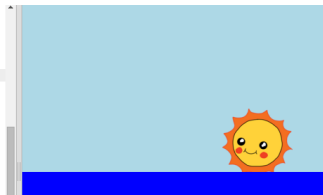
- If you want the sun to rise and then set, just add more keyframes to your animation:

```
@keyframes sunrise {
    0%
    33%
    66%
    100%
}
```

This means that the animation starts and ends with the sun at the bottom of the sky, and stays at the top from 33% until 66% of the animation.

- Now you just need to add the word `infinite` to the `#sun` animation to make it loop forever:

- Test out your animation. Does the sun keep rising and setting?

Step 6   **Animating the sky**

Animation isn't just for movement. Let's animate the sky to turn dark at night.

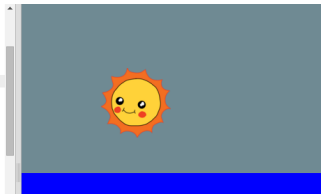- Add an animation called `sky` to your CSS:

```
@keyframes sky {
    0%
    100%
}
```

Notice that this time you're animating the colour of the sky, and not the position.

- Add code to your sky, to tell it to use your new animation:

```
animation: sky 10s;
```


- Click **Autorun** to test your animation.

Step 7   Challenge: Improve the sky

Can you change the sky animation so that it matches the sun and stays blue during the day and returns to black as the sun sets. Make it loop forever too.

## Step 8   Challenge: More animation

Can you animate another image? You can animate the position, colour, shape, size, opacity (seethroughness) or anything else you can think of. Also try changing the amount of time your animations run for.

For each item you want to animate, you will need to:

- Include it in your HTML with an id
- Add a style for the id
- Create an @keyframes rule
- Use `animation:` in the style to use the animation you defined with @keyframes

Click on the image icon to see the images that are included in the project:
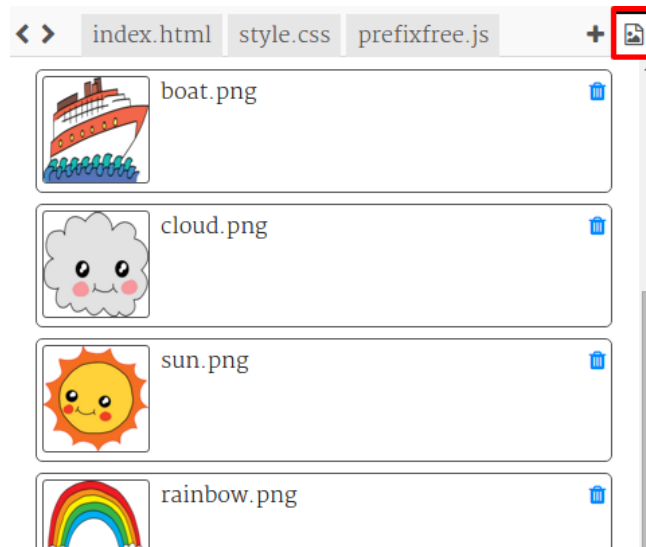
You can also upload your own images if you like.

Don't forget you can put items in the sea as well as the sky:

In the example the rainbow uses opacity for a fade effect:

```
@keyframes fade {
    0%
    50%
    66%
    100%
}
```

The boat uses a negative starting position so that you can't see it for part of the animation:

```
@keyframes left-right {
   0%
   100%
}
```

Published by **Raspberry Pi Foundation (https://www.raspberrypi.org)** under a **Creative Commons license (ht tps://creativecommons.org/licenses/by-sa/4.0/)**.
View project & license on GitHub (https://github.com/RaspberryPiLearning/sunrise)