

Tackling the Technology Gender Gap Together: **Environmental Web Design**

Level - Third Level

**Subject area/s – Technologies - Computing
Science, Social Subjects - People, Place and
Environment**



Environmental Web Design

Level - S1/S2 Third Level

Subject areas – Technologies - Computing Science, Social Subjects - People, place and environment

Experiences and Outcomes –

SOC 3-08a: I can identify the possible consequences of an environmental issue and make informed suggestions about ways to manage the impact.

TCH 3-14a: I understand language constructs for representing structured information.

TCH 3-15a: I can select appropriate development tools to design, build, evaluate and refine computing solutions based on requirements.

Benchmarks – Technologies – Computing Science

1. Demonstrates an understanding of structured information in programs, databases or webpages.
2. Describes the effect of mark-up language on the appearance of a webpage, and understand that this may be different on different devices.
3. Designs and builds web pages using appropriate mark-up languages.

Prior Learning - Pupils will have completed a wide range of 2nd level benchmarks.

TCH 2-14b: I understand how information is stored and how key components of computing technology connect and interact through networks.

- Demonstrates an understanding of how networks are connected and used to communicate and share information, for example the internet.

Pupils understand what the internet is and that we can use it to share information. They can identify the differences between the world wide web and the intranet. They can use the web to carry out effective research.

Duration of time – Approximately 11 x 50 minute lessons. (More time may be required for research and development of final website)

Computing Science Concepts and Approaches

Decomposition – planning of page content and making link between pages.

Debugging – testing website in both desktop and mobile browser mode.

Patterns – Maintaining a consistent design approach across all pages of website. Using correct tags and structure when writing HTML.

Resources required

Creating the website:

- education.weebly.com allows a teacher to create and manage up to 40 pupil accounts.
- [You Tube video tutorial provided in lesson pack demonstrating how to create a class.](#)

- [You Tube video tutorial for pupils demonstrating how to use Weebly to produce a website with multiple linked pages.](#)

Khan Academy can be used to create classes for pupils, the Intro to HTML and CSS course can then be assigned to pupils and progress can be tracked.

Useful websites which may help pupils with research:

<http://www.recycling-guide.org.uk/>

<http://www.greenerscotland.org/reduce-reuse-recycle/why-reduce-reuse-and-recycle>

Overview of learning

Pupils are learning about the consequences of an environmental issue. In this example, the impact of household waste on the environment. Pupils will have to conduct research on this topic as part of a group, ensuring that they are sharing tasks within the team. They should also include current news on the issue in their research.

Pupils should identify the ways in which we are currently managing the issue of household waste (multiple recycling bins, recycling centres, landfill) and then work together to come up with their own unique idea for a way to manage the issue. This could be to better inform people of the dangers or a better method of recycling specific things or an innovative technique for preventing waste.

This information (research and solution) will be presented on a website with linked pages. Pupils will learn about features of good web design and about how websites are built. They will learn about the technologies used to create websites and write some HTML using a Khan Academy course. Pupils will plan the content of the before using a drag and drop website builder like weebly to create and publish their website.

Pupil Objectives

- I can research information using a range of sources.
- I can identify a unique solution to help to lessen the impact of an environmental issue
- I can describe the technologies used to create a website.
- I can write simple HTML code making use of a range of tags
- I can present information in the form of a structured website.

Introduction

Introduction to what we are going to learn about. Pupils are going to produce a website informing people about the impact of an environmental issue and sharing their own solution to how we could help to lessen the impact of the environmental issue.

Main Activity

Lesson 1 – Introduction to project (Slides 1-6)

Objective: I understand what is meant by the term environment and I can identify some of the issues surrounding household waste affecting the environment

Introduce the project to pupils using slide 2. Explain that they will work together with a group to conduct research into a problem, they will then be expected to come up with their own solution to this problem.

Pupils will then learn about web development and produce their own website as a group. This website will include the details of the problem, pupil research and the solution they have come up with.

Ask pupils what their understanding of the environment is and recycling.

Use slides 4-5 to explain the issues that rubbish going straight to landfill causes for the environment.

Pupils can be placed in groups at this stage of no more than 4 people.

Ensure pupils know their log in details for Glow. Create a Yammer group for the project where pupils can share ideas and research with the rest of the class.

When carrying out the research stage of the task, Office 365 in Glow is helpful as pupils can collaborate with their group on one Word document or PowerPoint to share their research.

Show research template document to class. Explain what they should be looking for.

Each pupil in the group should take responsibility for researching a particular aspect of the topic. Allocate research roles to each member of the group.

Research Template

 Access:

Environmental Web Research	
Share any information you have found when researching your environment topic below. Remember to include links to all sources.	
Work together with your team, each team member should take responsibility for a particular aspect of your research.	
Topic:	
Research:	
Topic in the news:	
Problems:	
Solution Ideas:	
Solution:	
Links to sources used:	

Find out what the impact can be on the environment and on society. Save research in template provided. Pupils should share template among team members on Glow to allow for collaboration.

Lesson 2 – Group research (Slide 6)

Objective: I can carry out research into the environmental impact of household rubbish

More time should be provided for completing research into issue.

Pupils should be working on a shared copy of the research template using Glow.

Lesson 3 – Group Research (Slide 6)

Pupils should continue with research from last lesson.

Research should include a news article related to the topic.

Example: <http://www.bbc.co.uk/news/uk-england-london-39479006>

This news article should be shared with the class using the Yammer group.

Research into topic should be completed by the end of this lesson.

Introduce Slide 7 about the solution to the problem in preparation for next lesson.

Lesson 4 - Solution to the problem (Slide 7)

Objective: I can work together work together as a team to come up with a unique solution to the problem I have been researching

When carrying out research, pupils should have discovered the effect on our environment of the waste we send to landfill sites. They will also have discovered some of the many things we have put in place to prevent damage to our environment. For example – Reduce, reuse, recycle.

Pupils should now work together with their teams to come up with their own solution to this problem.

For example - should we be educating people on the damage we are doing to the environment? How could we do this?

Could they come up with a way to encourage more people to recycle or to make it a more convenient process.

The final solution that teams decide on should be detailed in the shared research template document.

Remind pupils that this solution will eventually be shared on a page of their final website.

Lesson 5 - Website planning (Slides 8-10)

Objective: I can plan the pages and content of my website, taking into account the problem, my research and solution as well as considering the features of good web design.

This lesson is the website planning stage of the project. Pupils should once again work on a shared copy of the web design template for planning using Glow.

Use slides 8-10 to explain features of good web design and the need for good consistent navigation in a website.

Show pupils an example of a website they will be familiar with such as www.bbc.co.uk, ask them to identify the target audience of the site. Point out the simple design, consistent colour scheme across the different sections of the site and ease of navigation.

Now show pupils examples of a poorly designed websites. Examples here:

<https://www.branded3.com/blog/top-10-worst-websites/>. Point out to pupils that a website should be simple and clearly structured. The audience should be able to

identify the purpose of your website at a glance and easily navigate to find what they are looking for. Just because you can have flashing pictures and text doesn't mean you should!

Using the web design template provided in pack identify what the four required pages of the website will be and what information will go on each page.

Lesson 6 - Web technologies (Slides 11-13)

Objectives:

I can identify technologies used for web development and the purpose of each.

I can write HTML code, identifying the changes that using different tags makes to the output.

Explain how several different technologies are used to create the websites we use on a day to day basis. Webpages are created using HTML tags for structure, CSS for style and Javascript for interactivity. Pupils will learn more about these technologies and create their own webpages using them. Show slides 11-12.

Show Khan Academy video: <https://www.youtube.com/watch?v=jHPr-CuvHhs>

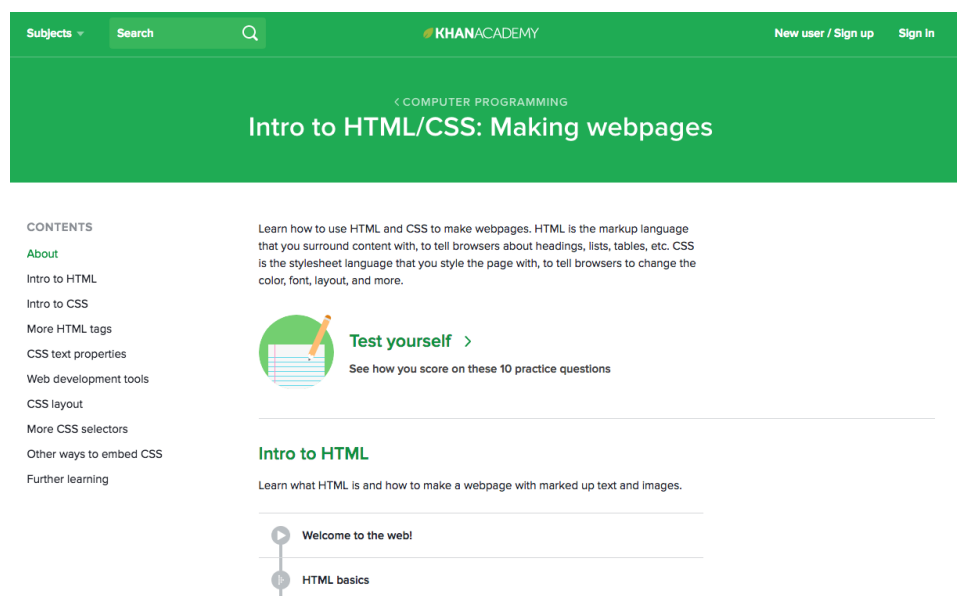
The Khan Academy video explains the differences between HTML, CSS and JavaScript and how they are all used together to create the websites we are used to seeing.

Pupils should then use tutorials on Khan Academy to write HTML code leading on to CSS. Pupils should work independently on this task but can support each other.

The teacher can create a class for pupils to join – this then allows progress and activity to be tracked. Follow instructions for creating a class here:

<https://khanacademy.zendesk.com/hc/en-us/articles/204850690-Create-a-class>

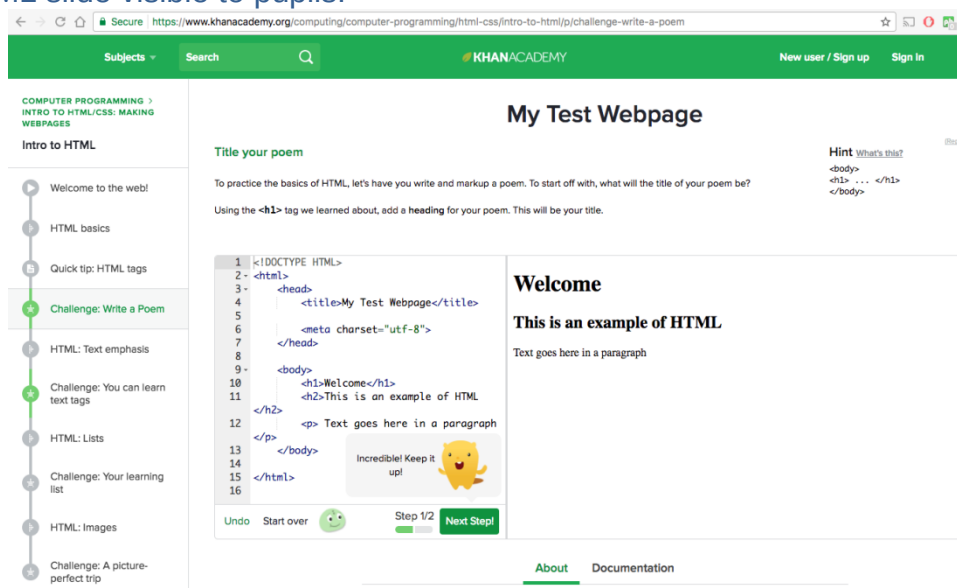
The mission pupils should be assigned is "Intro to HTML/CSS: Making Webpages".



Alternatively pupils can practise writing HTML at this link: <http://bit.ly/htmltask1> without an account, progress will not be saved.

The first challenge asks pupils to use basic HTML tags to write a poem. Pupils write code on the left hand side of the screen and the webpage preview is on the right. Introduce HTML tags to pupils using Slides 12-13. Remind pupils that most HTML tags

require both an opening tag and a closing tag. They should experiment with changing tags to see how the output changes..
Keep HTML slide visible to pupils.



The screenshot shows the Khan Academy interface for the 'Intro to HTML' course. The left sidebar lists the course progress, with 'Challenge: Write a Poem' highlighted. The main area is titled 'My Test Webpage' and contains instructions for writing a poem using HTML tags. A code editor shows the following HTML code:

```

1 <!DOCTYPE HTML>
2 <html>
3   <head>
4     <title>My Test Webpage</title>
5     <meta charset="utf-8">
6   </head>
7   <body>
8     <h1>Welcome</h1>
9     <h2>This is an example of HTML</h2>
10    <p>Text goes here in a paragraph</p>
11  </body>
12 </html>

```

The preview on the right shows the rendered output: 'Welcome' as a large heading, 'This is an example of HTML' as a subheading, and 'Text goes here in a paragraph' as a paragraph. A hint box shows the basic HTML structure: `<body>`, `<h1> ... </h1>`, and `</body>`. The bottom of the interface includes 'Undo', 'Start over', 'Step 1/2', and 'Next Step!' buttons.

Lesson 7 - HTML coding (Slide 13)

Objective: I can follow a web development tutorial on Khan Academy to write HTML code for a website.

Pupils should continue working through tutorials on Intro to HTML course on Khan Academy.

If teacher adds pupils to class then pupils progress can be tracked.

Ask pupils about the different tags they have learned. Ask them to explain the effect that the use of a tag had on the output of their text in the preview.

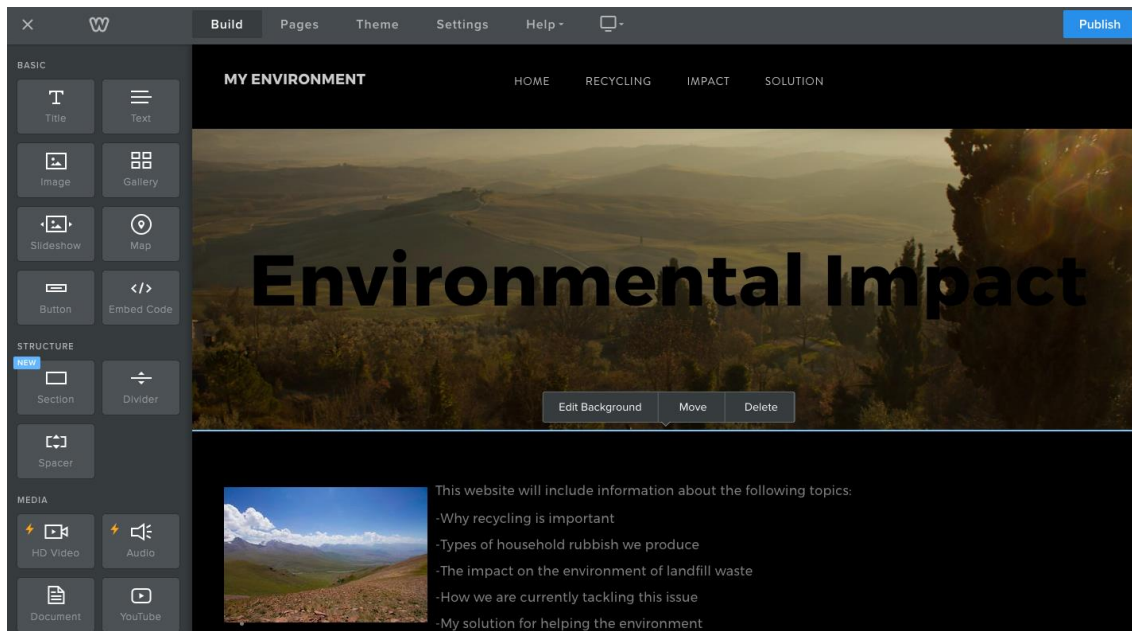
Lesson 8 – Creating the final website (Slide 14)

Objective: I can use the drag and drop web development site Weebly to produce a website based on my plan.

Create a Weebly class and give pupils usernames and passwords. Demonstration of this provided in video in lesson pack. Class websites can be set to private so that they can only be viewed when published if the password is known.

Pupils should experiment with different features and themes. Pupils can begin creating website based on design. There is a video provided in the lesson pack demonstrating the development of an example website using Weebly.

Each pupil in the team should take responsibility for at least one page of the website to ensure that they get a chance to use Weebly.



Lesson 9 - Completing website (Slide 14)

Objective: I can complete my final website including all required information (problem, research, solution)

Pupils continuing work on building website and linking pages using weebly. If any additional research or multimedia is required at this stage ensure work is shared between team members.

Lesson 10 – Website evaluation (Slide 15)

Objective: I can use the website evaluation document to evaluate the content of my website to test that it meets all requirements.

Completing website using weebly and evaluating project overall against objectives using evaluation template document provided.

Environmental Website Evaluation

Use the list below to check that you have met all requirements of your website.

Requirement	Completed
I have completed four pages of my website	
I have included research about the environmental issue	
I have included links to my sources of information	
I have referenced a news article about my issue	
I have included details of my unique solution to help the issue	
I have linked pages so they can all be accessed from a navigation bar	

Self Evaluation

Two things I think I have done well are:
One thing I would like to improve on is:

Peer Evaluation

Two things I think you have done well are:
One thing you could improve on is:

Lesson 11 - Website demonstration

Objective: I can demonstrate my website to the class with my team, explaining my research and solution I have come up with to the environmental problem.

Pupils can publish their websites so that they can be viewed online with the correct password.

They should then demonstrate their websites to the rest of the class, explaining their understanding of the issue of household waste on the environment, the research they carried out and the solution they came up with to combat this problem.

Plenary

Pupils can publish their websites and evaluate them based on the success criteria and benchmarks.

Pupils can demonstrate their research, solution to the problem and their completed website to the rest of the class as a team. They can answer questions about the topic and design decisions they made when developing their website.

Differentiation

Pupils can be provided with information on topic to reduce the amount of research they need to complete.

Pupils could undertake this task as a development pair or team.

Pupils can extend this activity to include more pages and experiment with some of the features of weebly. Including editing the HTML and CSS code.

Use KhanAcademy to further extend learning of HTML and CSS through tutorials.

Assessment Opportunities

1. Pupils have been observed researching and planning the content of each webpage demonstrating the layout and structure. This has then been implemented into a functional website. Pupils can publish their website and share it privately which provides evidence.
2. Pupils can write HTML code in Khan Academy, pupil progress on HTML and CSS tutorials is tracked using class features. Pupils are making use of different tags to alter the appearance of a webpage and can explain the effect of using different tags. Pupils can explain the differences in technology for the web (HTML, CSS and JavaScript) and can identify what each is used for.
3. Building a website mainly using drag and drop functionality of weebly, pupils will also edit the HTML of the weebly site.

Teaching Notes

This research and web development task could be applied to any topic or problem.

The example provided is: **The Impact of our Waste.**

Research task could be extended to learn about data gathering using a tool like Microsoft Forms in Glow. Alternatively Google Forms or Survey Monkey could be used.