Lesson 1: Welcome to the Internet

45 minutes

Overview

After a short transition from representing information in Unit 1 to communicating information in Unit 2, students take time to think about their knowledge of the Internet and how it works. Following this, students are introduced to a new widget: The Internet Simulator which they will use throughout this unit to explore the inner workings of the Internet. Students should leave this lesson primed to know more about the Internet.

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2017)

▶ **NI** - Networks & the Internet

Agenda

The Pre-Unit Pulse

Warm Up (5 minutes)

Activity (35 minutes)

- **What is the Internet?**
- **Explore the Internet Simulator**

Wrap Up (5 minutes)

- **Assessment: Check For Understanding**

Objectives

Students will be able to:

- Identify questions they have about how the Internet works
- Use the Internet Simulator to communicate information with a partner

Preparation

- Test out the Internet Simulator. If you open up the level on two different tabs, you can use it by yourself.
- Prepare for the Teacher Demo.
- Check the **"Teacher's Lounge"** forum for verified teachers to find additional strategies or resources shared by fellow teachers
- If you are teaching virtually, consider checking our **Virtual Lesson Modifications**

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the teachers

- **CSP Unit 2 Slides** - Slides
  Make a Copy
- **Welcome to the Internet** - Slides
  Make a Copy

For the students

- **Unit 2 Journal - Digital** - Resource
  Make a Copy
- **Unit 2 Journal - Interactive Notebook** - Resource

Make a Copy

- **What is the Internet?** - Video (**Download**)

Teaching Guide

The Pre-Unit Pulse

Have your students complete these questions independently some time before starting this unit.

1-3 The Pre-Unit Pulse

1 2 3

Teaching Tip

Pre-Unit Pulse Questions: The answers to these questions can provide insights into the preferences, strengths, and motivations of your students. If you'd like to adapt the questions or add in your own, you may want to make a copy of **this Google Form** which already has the existing questions populated.

For more tips and ideas of how to use these questions, check out the **CSP Guide to Pre-Unit Pulse Questions**

Warm Up (5 minutes)

Distribute: Give each student a copy of the Unit 2 Journal (**Digital**/**Interactive Notebook**) or have students set up this unit's section in their CSP journals.

Teaching Tip

Journaling: Journaling can take many different forms, but in general, it's a tool for individual processing and reflection in a form that can be revisited as students develop their skills and understandings. The medium used for journaling can vary depending on classroom needs.

For more guidance and examples, check out the **CSP Guide to Journaling**

Discuss: *We've learned to represent images, text, and sound digitally - but, we haven't discussed what we do with all this digital data. How do you see people sharing this kind of data in the real world? Who do they want to share it with and why?*

Discussion Goal: This discussion can be open-ended and feel like a brainstorm to help setup the transition from Unit 1 into Unit 2. It is important to draw on students' personal experiences with sharing data on the internet, social media websites & apps, and connected devices.

Thinking about this unit as a whole, it is helpful to validate ideas that consider the motivations and consequences of how digital information is shared. These can be important points to return to at the end of the unit when introducing the Internet Dilemma's project.

Remarks

> So far this year, we've investigated how to represent information digitally. Today, we're going to investigate what it would take to communicate this information with others.

Activity (35 minutes)

What is the Internet? (20 minutes)

Journal (10 mins): *Answer each of these prompts in your journal:*

- *What is the Internet?*
- *What questions do you have about how the Internet works?*

Teaching Tip

Give students 10 minutes to write in their journals. It's ok if there are some awkward silences. We want students to have the time to really think deeply about what they know and don't know.

If students are struggling to come up with things to write down, consider asking the following:

- When you enter a web address in a browser and hit enter, what happens? At some point you see the web page in the browser, but what happens in between? What are all the steps?
- Write down the series of things that you think (or have heard) happen right after you hit Enter. What happens first, second, third and so on.
- Don't worry if you don't know all the pieces or how they all fit together. If you don't know a step, or you are fuzzy on some details, or there's a gap, that's okay. Just write down the parts that you know.

Discuss: Ask a few students to share their answers with the class.

Discussion Goal: Ask for a few volunteers to share what they know about the Internet. It's ok if answers are light or even incorrect! This is the starting place for the unit.

Remarks

> It's ok if you have a lot of questions about the Internet or aren't sure how it works. You are not alone!

Do This: Direct students to take two sticky notes and choose one response or question to put on each sticky note. Post the sticky notes on a poster in the front of the room to refer back to throughout the unit as questions are answered.

Video: Play **"What is the Internet"**. Stop at 1:30.

Teaching Tip

Use the video to normalize students' misconceptions about how the Internet works. Over the course of the unit, we will work to address those points of confusion.

To encourage active engagement and reflection, use one or more of the strategies discussed in the **Guide to Curriculum Videos**.

Explore the Internet Simulator (15 minutes)

Remarks

> In this unit, we are going to use a tool to understand how the Internet works, layer by layer. Just like when we talked about layers of abstraction in representing digital information, there are layers to the Internet.
>
> This tool is called the Internet Simulator. Let's check it out!

Group: Pair up students.

Do This: Direct students to Level 2 on Code Studio. Students should join their partners following the instructions on the slide.

Remarks

> Take five minutes to explore the tool and see what you can do with it. What are the limitations?

Do This: After five minutes are done, join the Internet Simulator yourself (as a teacher) and join a volunteer student. Model how the widget works.

- Call out the different sections of the widget:
  - Received Message Log
  - Sent Message Log
  - Send a Message
- Show students the "My Device" tab and demonstrate how you can turn on or off the layers of abstraction (binary, decimal, ASCII).
- Talk about what the graphic represents - a direct line between you and your partner.

Discuss: *How is the Internet Simulator similar to the Internet? How is it different?*

Discussion Goal: Encourage students to speak from their own experience of using the Internet. Here are some things they may bring up:

- Similar to the Internet:
  - I can send information to another person
  - It all comes back to zeroes and ones
- Different from the Internet:
  - I can only send text
  - It takes a couple seconds to send a text instead of instantly

Remarks

> One of the key things you may have noticed is that this version of the Internet Simulator only allows us to connect to one person! This will change as we explore new versions on the Internet Simulator while learning about how the Internet works.

4 **Internet Simulator**

Wrap Up (5 minutes)

Video: Watch the rest of the "What is the Internet" video (starting at 1:30).

Teaching Tip

Videos are used throughout the curriculum to spark discussions, supplement key concepts with additional explanations and examples, and expose students to the various roles and backgrounds of individuals in computer science.

While interacting with the video, turn on closed captioning so students can also read along as they watch.

To encourage active engagement and reflection, use one or more of the strategies discussed in the **Guide to Curriculum Videos**.

Remarks

Why learn about how the Internet works? As Vint Cerf Says: "You can't escape from contact with the Internet. So why not get to know it?" But you don't have to take Vint Cerf's word for it. Some of the largest issues facing society hinge on an understanding of how the Internet functions.

At the end of this unit you will do a project focusing on a societal issue. As you go through these lessons keep you ears and eyes open for how things work.

Many of the issues are related to people taking advantage of the open protocols that make the Internet function and present us with tricky dilemmas. We will learn about protocols later in this unit.

For example, there are two major issues to think about:

- Net Neutrality is a raging legal debate about the principle that Internet service providers should enable access to all content and applications regardless of the source, and without favoring or blocking particular products or websites.
- Internet Censorship is the attempt to control or suppress what can be accessed, published, or viewed on the Internet by certain people. This can be used to protect people (i.e. to not allow access to child pornography) but can also be used to limit free speech.

In order to have an informed opinion, it helps to understand the technical underpinnings of how the internet works.

Finally, a major issue that our society faces is that far too few people actually understand how the Internet works! We are going to change that over the next few lessons.

Assessment: Check For Understanding

Check For Understanding Question(s) and solutions can be found in each lesson on Code Studio. These questions can be used for an exit ticket.

Question: How do you use the Internet? Think about your typical day. When are you using the Internet? For what purposes? What role does it have in your life?

5 **Check For Understanding**