



Science



120 min

Educator's
Guideacer
for education

Screen Sense

Intel® Core™ processors



Summary: Students will explore the impact of prolonged screen time on health. Inspired by Acer's User Sensing technology, they will use Python with Jupyter Notebook (on Windows) or Google Colab (on Chromebooks) to develop solutions for healthier screen habits. They will then create an educational poster promoting these best practices

Key Concepts

Work Ergonomics

Software

Jupyter Notebook

Google Colab
Canva

Instructional Objectives

Learners will be able to:

1. Understand the health challenges associated with prolonged screen time.
2. Experiment with Python code using Jupyter Notebook (on Windows) or Google Colab (on Chromebooks) to explore how different settings affect screen habits.
3. Create an educational poster to promote healthier screen use.

Learning Outcomes

Students will understand the importance of managing screen time. They will create a poster that educates others on maintaining healthy screen habits.

Real World Application

Learners will acquire skills in using technology to monitor screen habits and communicate best practices through educational materials, which they can apply to improve their health and productivity.

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1. Lesson Overview

	Activity	Innovation Skill
Introduction (15 min) Slides 1 – 7	Explore screen habits and the effects of prolonged screen use on our bodies through discussion and video analysis.	
Development (85 min) Slides 8 – 28	<p>Explore and address screen-related issues through hands-on activities and coding practice.</p> <p>Discuss the most comfortable screen distance and its impact on eye strain.</p> <p>Apply and make iterative refinements in the Python code to monitor screen habits using Jupyter Notebook (Windows) or Google Colab (Chromebook).</p>	<p>Design Thinking (Empathize)</p> <p>Programming & Coding (Iterative Refinement)</p>
Conclusion (20 min) Slides 29 – 34	Summarize key learnings, reflect on challenges, and create a poster to promote healthy screen habits.	



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2. Session Preparation

Logistics

Items

Laptop or Desktop, Chromebook (Recommended: 2 learners per laptop)

Installation Guide, Worksheets

Installation

1. Refer to the Screen Sense Installation Guide in your working folder:
 - Windows (Jupyter Notebook): Follow instructions in working_folder_windows.
 - Chromebook (Google Colab): Follow instructions in working_folder_chromebook.
2. Download and extract files in the "Working Files" folder.
3. Other things to note:
 - For hardware requirements, please refer to the minimum hardware requirements from the software provider.

Working files contain:

- Installation guides
- Jupyter Notebook , Chromebook (.ipynb file)
- Worksheets – 1 & 2, Answer Key



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3. Activity Guide

Introduction (slides 1 – 7)


Duration	Slide	Activity
15 min	1	Introduction to the lesson
	2	<p>The Educator begins by providing an overview of the lesson</p> <ul style="list-style-type: none"> • Explore the science behind eye strain and its effects on the body. • Understand the impact of prolonged screen time on physical health. • Exploring principles for creating a healthier digital workspace. • Monitor screen time and screen distance using Jupyter Notebook or Google Colab. • Create a public awareness poster to promote healthy screen habits and their benefits.
	3	Ask students to answer the poll question about their daily screen time. Encourage honest answers and remind them there's no right or wrong response.
	4	<p>Pose the follow-up question asking how they feel after prolonged screen use. Please encourage students to describe their experiences in detail. Prompt them with questions like:</p> <ul style="list-style-type: none"> • Do your eyes feel tired or strained? • Do you get headaches? • Does your neck or back hurt? • Do you feel generally uncomfortable?
	5	Explain to students that the class will watch a timelapse video of a person. Encourage students to pay close attention to the person in the video. Ask students, What did you observe in the video? Why do you think the person looked uncomfortable?
	6	After students watch the video, ask them to describe the person's facial expressions and movements and consider what these signs might reveal about their feelings. Discuss why the person might have made these adjustments and how they relate to their discomfort. Invite students to reflect on their experiences with prolonged screen time and share any similar discomfort.
	7	Read the main problems of extended screen use: Eye strain, headaches, neck pain, and general body discomfort. Ask students if they have experienced these issues during or after prolonged screen use. Use their responses to guide a discussion on possible causes for these problems.



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3. Activity Guide

Development (slides 8 – 13)

Duration	Slide	Activity
30 mins	8	Now, we will explore the reason behind specific problems caused by prolonged screen time.
	9	Introduce the activity where students will explore how screen distance affects eye and body comfort. They will measure different distances from the screen and assess how easy or difficult it is to read text. Please direct them to Worksheet 1 for detailed instructions on conducting the activity.
	10	Students will use a measuring tape to position themselves at 30 cm, 60 cm, and 90 cm from the screen. At each distance, they will read the article provided on the slide. They should follow the worksheet instructions, observing and noting differences in comfort or clarity at each distance.
	11	After the experiment, ask students which distance they found most comfortable and where the text was clearest. Allow them to discuss their findings in pairs before sharing with the entire class. To understand why different distances affect comfort, introduce the need to explore the eye's internal structure.
		 <p>Mindset: Design Thinking Empathize Learners analyze and understand problems from perspectives that are different from their own, which is critical to identifying problems from other people's points of view.</p>
	12	Explain that light enters the eye through the pupil, is focused by the lens onto the retina, and is then converted into signals that the brain processes into images.
	13	Explain that accommodation is how our eyes change their focus to see things at different distances. When the screen is too close or too far, the eyes must work harder, which can make them tired. This extra effort can lead to headaches, blurry vision, and dry eyes.



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3. Activity Guide

Development (slides 14 – 20)


Duration	Slide	Activity
15 mins	14	Remind students that the 60 cm distance was the most comfortable, close to the recommended 45-70 cm range. Stress the importance of taking breaks every 30 minutes to avoid eye strain. Explain that maintaining this distance and taking regular breaks can help reduce eye strain, improve focus, and enhance comfort—transition to discussing why neck pain and physical discomfort can also occur.
	15	Remind students that they sat at three different distances—30 cm, 60 cm, and 90 cm—to find the most comfortable viewing distance. Now, let's figure out which posture is most comfortable, too. Ask them to recall their experience, identify the best posture, and explain why.
	16	Present the images of spine positions at different distances. Ask students to identify which spine position looks the most comfortable and why that might be.
	17	Explain to students that sitting too close or far from the screen can strain their spine and muscles. Emphasize that maintaining an optimal distance of 45 to 70 cm will reduce eye strain, help keep the spine straight, and reduce pressure on the neck and back.
	18	Recap the key takeaways: maintaining an optimal screen distance, taking regular breaks, and keeping a correct posture.
	19	Guide students to reflect on how technology can help them consistently follow healthy screen habits, including maintaining correct posture, optimal screen distance, and regular breaks. Ask them to consider whether technology can automate these practices to ensure adherence.
	20	Begin by explaining the challenge: it's hard to maintain optimal screen distance and consistently take regular breaks. Introduce the concept of Computer Vision (CV) as a solution, emphasizing that CV allows computers to process and analyze visual data from images or videos.



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3. Activity Guide

Development (slides 21 – 26)

Duration	Slide	Activity
35 mins	21	Encourage students by saying: 'Now that we've identified critical issues with prolonged screen time and discussed possible solutions, it's time to dive deeper. Your mission is to use Computer Vision (CV) technology to apply these solutions and develop a tech-based approach to promote healthier screen habits.'
	22	<p>Explain to students that they will complete a two-part mission to promote healthy screen habits.</p> <p>Step 1: Hands-On Practice</p> <ul style="list-style-type: none"> Students will interact with the provided CV code in Jupyter Notebook (Windows) or Google Colab (Chromebook). <p>Step 2: Create a poster to make people aware of healthy screen habits.</p> <ul style="list-style-type: none"> Students will design a poster to raise awareness about maintaining healthy screen habits.
	23	Guide students in interacting with the provided CV code in Jupyter Notebook (Windows) or Google Colab (Chromebook). The goal is to create an application that monitors screen distance and alerts users to take breaks.
	24	Let students know they will get hands-on experience by exploring and modifying the code. They will work with pre-written code to apply their learned solutions and see how these features operate.
	25	<p>Direct students to follow the Screen Sense Installation Guide to set up the environment, upload, and run the code in Jupyter Notebook (Windows) or Google Colab (Chromebook). Encourage them to apply solutions like maintaining optimal screen distance and setting regular break intervals in the code, and have them read the instructions thoroughly and answer the questions provided.</p> <div>  <p>Skillset: Programming & Coding Iterative Refinement Learners debug their work, learn from mistakes, and persevere in the face of challenges to develop reliable and trustworthy solutions.</p> </div>
	26	Explain that the hands-on practice with Jupyter Notebook (Windows) or Google Colab (Chromebook) has provided students with a practical understanding of managing screen time and maintaining screen distance. Highlight that Acer laptops offer real-world solutions using similar principles to support healthy screen habits.



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3. Activity Guide

Development (slides 27– 28)		
Duration	Slide	Activity
05 mins	27 - 28	<p>Acer’s Break Reminder Feature: Emphasize how this feature aligns with the solutions students learned to reduce eye strain by allowing customization, similar to what they implemented during their hands-on practice in Jupyter Notebook (Windows) or Google Colab (Chromebook).</p> <p>Acer’s Screen Distance Measurement Feature: Explain how this feature reinforces the optimal distance concepts students applied in their code. Highlight that real-time alerts and adjustments help maintain the correct screen distance, reducing eye strain and improving posture.</p>



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3. Activity Guide

Conclusion (slides 29 – 34)

Duration	Slide	Activity
20 min	29	<p>Explain to students that they will use Canva to create a poster promoting healthy screen habits.</p> <p>Note: If educators find that time is running short, they may skip the poster creation activity (slides 29 to 30) and proceed to slides 31 through 34. In such cases, you can assign the poster work as optional homework to ensure that students still complete this task.</p>
	30	Explain to students that this activity involves creating a Canva poster to promote healthy screen habits by incorporating the points they've learned. This task allows them to showcase their creative skills in a visually engaging format. Direct students to refer to Worksheet 2 for detailed guidelines on creating the poster and what to include.
	31	Introduce the slide by explaining the importance of reflecting on the topic learned and discussing key insights.
	32	Encourage students to reflect deeply on each question and share their thoughts. Ask them to consider specific habits they will change to improve their screen time and posture and to outline practical steps they plan to take. Have them explain the design choices for their posters, focusing on how they made them both visually appealing and informative.
	33	<p>Conclude the lesson by summarizing the key takeaways from our project:</p> <ul style="list-style-type: none"> • Learned about the effects of prolonged sitting and strategies for managing them. • Used Python code in Jupyter Notebook (on Windows) or Google Colab (on Chromebooks) to monitor screen time and maintain screen distance. • Explored Acer user sensing features, including break reminders and distance measurement. • Created a poster to promote healthy screen habits and their benefits.
	34	End of the lesson.



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4. Troubleshooting Tips

Common Mistakes & Issues : Jupyter Notebook

	Issue	Possible Reasons	Resolution
1	Jupyter Notebook cannot run code (an asterisk appears instead of a number In[*], and the kernel circle is filled)	Antivirus software installed on the computer may interfere with Jupyter Notebook's connection.	Stop the antivirus software and restart the kernel.
2	Not Found/Not defined Error	The user missed the execution of specific code cells.	Use shift + enter to execute the code cells. Ensure you run all of the cells before proceeding to the next cell.



Common Mistakes & Issues : Google Colab - Chromebook

	Issue	Possible Reasons	Resolution
1	Code cell taking too long to execute.	Colab may have lost connection to the runtime.	Interrupt the execution, click the "Stop" button, or reset the runtime.
2	The webcam feed or image capture is not working.	Colab might not have permission to access the webcam.	Check the browser settings and ensure Colab has permission to access the webcam. Alternatively, try reloading the page or restarting the runtime.



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5. Assessment Rubric

Focus	Learning Outcome	Approaching Expectation	Meeting Expectation	Exceeding Expectation
 Design Thinking (Empathize)	Analyze and understand the discomfort experienced by others from prolonged screen use, relating it to personal or observed experiences.	Identifies discomfort related to screen use but offers a primary or incomplete analysis. Limited connection to others' perspectives or personal experiences.	Provides a clear explanation of discomfort from screen use, showing an understanding of how others might feel and relating it to their own experiences.	Examines from multiple angles and provides a detailed, insightful perspective on discomfort. Demonstrates a deep understanding of others' experiences and effectively connects these insights with their observations.
 Programming & Coding (Iterative Refinement)	Test, debug, and modify variables iteratively to refine the code and enhance the application's functionality.	Makes some adjustments to the code but demonstrates limited understanding of the impact on functionality, requiring additional support for testing and debugging.	Effectively modifies the code, demonstrating an understanding of how changes improve functionality. Tests and refines the code with successful results.	Independently experiments with various refinements, thoroughly tests, and optimizes the code to enhance performance significantly, demonstrating strong problem-solving and debugging skills.

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