5E Lesson Plan (NGSS)

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| **Teacher:**  |
| **Date:** |
| **Subject / grade level:** Science, Grade 8, Lesson # |
| **Topic:** Different types of INTERNET connections  |
| **Materials:**Computer, COSMOS Technology Toolkit, Handouts   |
| **Essential Question(s):** How has technology changed the way we communicate?   |
| **New York State P-12 Science Learning Standards (NGSS):** MS-PS4-3. Integrate qualitative scientific and technical information to support the claim that digitized signals are a more reliable way to encode and transmit information than analog signals.

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| **Science & Engineering Practices (SEPs)** | **Disciplinary Core Ideas (DCIs)** | **Crosscutting Concepts (CCs)** |
| **Developing and Using Models**Modeling in 6–8 builds on K–5 and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. **Obtaining, Evaluating, and Communicating Information**Obtaining, evaluating, and communicating information in 6-8 builds on K-5 and progresses to evaluating the merit and validity of ideas and methods. | **PS4.A: Wave Properties**A simple wave has a repeating pattern with a specific wavelength, frequency, and amplitude. (MS-PS4-1)**PS4.C: Information Technologies and Instrumentation**Digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. (MS-PS4-3) | **Patterns**Graphs and charts can be used toidentify patterns in data (MS-PS4-1) **Influence of Science, Engineering, and Technology on Society and the Natural World**Technologies extend the measurement, exploration, modeling, and computationalcapacity of scientific investigations (MS-PS4-3) **Science is a Human Endeavor**Advances in technology influence the progress of science and science has influenced advances in technology (MS-PS4-3)  |

**Common Core State Standards (CCSS):****SL.8.5** Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest. **RST.6-8.9** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text or prepared information on the same topic.  |
| **Lesson Topic:** Different Types of INTERNET Connections & their Data Transfer Speeds **Learning Target:** I will: * Identify & describe 5 different types of internet connections
* Perform an experiment to show which internet connection method has the fastest data transfer speed
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| **Differentiation strategies to meet diverse learner needs:*** **Bodily kinesthetic learners** - Local and Express demonstration hands-on activity
* **Audio and Visual learners** – Slide show, Visual representation of activity using computer, transmitter and receiver, The observations/data collected throughout the activity
* **ELL/Low reader** - Guided notes printed for those who require them
* **Technology**- Utilizing COSMOS Technology Tool Kit
* **Extended time** for those who require it
* **Small groups** according to levels, behavioral needs, and activity requirements
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| **ENGAGEMENT** 1. Discussion Question(s)
* Can you name different types of internet connections?
* What can cause your internet NOT to work properly?
1. Teacher will use a short slide-show to explain 5 different types of internet connections
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| **EXPLORATION** 1. Students will view a short slide show to introduce the lesson. Materials & equipment are set up on student’s desks. Students are in small groups & will assign roles to each other for the activity, e.g. note taker, reader etc. One student will read out loud from the handout and the group will perform the activity.
2. Activity:
3. Teacher will supervise students as they perform the activity on the COSMOS Technology Toolkit.
4. Students activity involves 3 steps: 1) Students will record the time it takes to transmit a specific amount of data over the INTERNET using 5 different internet transmission methods (this will be a simulation done on the COSMOS Technology Toolkit). They will then calculate the internet transmission speed. 2) Students will draw a graph of the different times it took for each transmission on their handout. 3) Students will then answer questions that follow their activity.
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| **EXPLANATION**After students complete their experiment there will be a discussion/share-out with their observations and comments about their activities - facilitated by the teacher. Analyzing information collected on their handout and identifying any errors that may have been made and correct them. Explanation of different types of INTERNET connection and how data transmission speeds are calculated will be done. Vocabulary words: INTERNET, data, transmission speed, byte, bit, are all clarified and strengthened.  |
| **ELABORATION**Students will extend their knowledge of different INTERNET transmission rates by discussing the following question(s): What things you think the next generation of internet technology will allow us to do? Be realistic.  |
| **EVALUATION** 1. Teacher Observation
2. Correctly following procedures
3. Students complete the questions on their handouts
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| **HOMEWORK** In 1 paragraph state who is your internet provider at home and whether or not you think you’re your service is good. What is your internet transmission speed?  |