Lesson Plan Template

Teacher(s) Names (include collaborators):
Course Name: Computer Science
Time Frame (in minutes): 90
Unit/Theme:
Grade Level: 12

CONTENT AND SKILLS
Learning Objectives: • **Understand** the concept of data structures and their application in programming. • **Analyze** data from various sources to determine trends in generational preferences. • **Design** a program that uses data structures to maintain and manipulate data. • **Evaluate** statistical measures such as mean, median, and mode in the context of data analysis. • **Collaborate** effectively to gather, analyze, and present data findings
Essential Questions: • How do data structures facilitate the management and manipulation of data? • What trends can be identified in generational preferences for media? • How can statistical measures enhance the understanding of data trends?
Students I can statements . . . • I can design a program using data structures to manage data. • I can analyze data to identify trends in generational preferences. • I can apply statistical measures to support my findings.
How will you meet the needs of SWD and ELL/MLL students? • Provide visuals and templates • Use closed captioning • Provide reading assistance
Content Standards List all standard indicators (do not need standard statement)
• .Math   ○ **HSN.Q.A.1**: Use units as a way to understand problems and guide the solution of multi-step problems.

- **HSS.ID.A.1**: Represent data with plots on the real number line (dot plots, histograms, and box plots).
- **HSS.ID.C.7**: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

NYS Computer Science and Digital Fluency Standards
List all standards that authentically align

- **9-12.CT.2**: Collect and evaluate data from multiple sources for use in a computational artifact.
- **9-12.CT.7**: Design or remix a program that utilizes a data structure to maintain changes to related pieces of data.
- **9-12.DL.2**: Communicate and work collaboratively with others using digital tools.
- **9-12.NSD.4**: Evaluate and refine a solution that simulates a network or system using a programming environment.

NYS SEL BENCHMARKS
https://www.p12.nysed.gov/sss/documents/SELBenchmarks2022.pdf

- **1C.5b**: Identify and apply strategies intended to address their obstacles in working toward goals beyond high school.
- **2C.5a**: Reflect on the results of using communication and social skills in daily interactions with peers, teachers, and families and develop strategies to improve in areas that are challenging.
- **3B.5b**: Evaluate how decision-making regarding equity, diversity, and fairness affects interpersonal and intergroup relationships, and ways decision-making can support civic engagement.

INSTRUCTIONAL PLAN
List the steps of the lesson, including instructions for the students including how they will construct and practice content knowledge.

Add Standard Indicators next to activity that aligns and highlight them.

Introduction (15 minutes)

Hook: Engaging Students with a Discussion on Media Trends

1. Ask students:
    - “What’s your favorite movie, song, or book?”
    - “Do you think people from other generations would like the same things? Why or why not?”
2. Discuss how media preferences evolve and what factors might influence them (e.g., technology, culture, access to platforms).
3. Show a short **infographic (In resources)** on generational media consumption - Pew Research link in resources

📌 **Teacher Tip:** Encourage students to compare their preferences with their parents or younger siblings.

Objective Overview

- Explain that students will act as **data analysts** to examine generational media preferences.
- Outline the three key activities:
    1. **Data Gathering:** Collecting media preference data from different generations.
    2. **Program Design:** Organizing the data using programming.
    3. **Data Analysis:** Identifying trends using statistics. **9-12.CT.7**

Activity 1: Data Gathering (25 minutes)

Instruction: Introduction to Data Collection Methods

- Explain how **quantitative** (e.g., survey responses) and **qualitative** (e.g., reviews, opinions) data can be used.
- Show examples of existing media trend reports: Links below
    - **Music**
    - **Movies**
    - **Books**

Task: Group-Based Data Collection

1. **Form groups** (3-4 students per group).
2. Each group selects:
    - **A media category** (Movies, Music, or Books).
    - **A generation** (Generation Alpha, Z, Millennials).
3. Collect data by:
    - Conducting a **Google Forms** survey (Google Forms Tutorial). **9-12.DL.2**

- Using **online databases** (links above).
- Analyzing **social media polls** (e.g., TikTok trends, YouTube comments).

Standards Alignment:

9-12.CT.2 – Collect and evaluate data to draw conclusions.

📌 **Teacher Tip:** Guide students in writing **unbiased survey questions**, e.g.,

- "What genre of movies do you watch most?" vs. **Avoid:** "Do you like superhero movies?"

Activity 2: Program Design (30 minutes)

Instruction: Introduction to Data Structures

- Explain how **arrays** and **lists** store multiple data points efficiently.
- Show simple Python examples of lists storing data:

Assessment

Formative Assessment:

✅ Monitor student participation in discussions.
✅ Provide feedback on their **survey design** and **program structure**. **9-12.NSD.4**

Summative Assessment:

📊 **Evaluate completed programs** for:

- Proper use of lists/arrays.
- Ability to modify and store data.
  📈 **Assess data analysis** for:
- Correct statistical calculations.
- Thoughtful interpretation of results.

Extensions

- **Advanced students:** Expand their program to **visualize data** using Python's `matplotlib`.

- **Ethical discussion:** How can media companies **manipulate data** for profit

FUTURE READY COMPETENCIES

Check off each competency that students will interact with during this lesson.

- ☑ Collaboration
- ☑ Communication
- ☑ Critical Thinking/Problem Solving
- ☐ Creativity & Innovation

MATERIALS / RESOURCES

Add additional resources needed for this lesson such as instructional technology templates, images, videos, etc. ***Including Instructional Technology Tools***

- Pew Research
- **Music:** Spotify Wrapped Statistics
- **Movies:** IMDb Popularity Trends
- **Books:** New York Times Bestseller Lists
- Google Sheets or Excel
- Python (Google Colab, Jupyter Notebook, or Replit)
- Online databases for media trends
- Survey tools (Google Forms, Mentimeter, or SurveyMonkey)