73. Science, Technology, Engineering, and Mathematics Cluster - Statistics Careers (4 hours)

Purpose/Abstract: To introduce students to entry-level careers in statistics.			
NCCCS Adult Education Standards: R.5.2.9, W.5.2.6, M.4.2.3			
Learning Objective: *By the end of the session, students will be able to:* ● Describe what statistics is and how it helps us. ● Identify the responsibilities of statistical assistants and which soft skills help them in their careers ● Analyze and graph the national wages and employment trends for statisticians and statistical assistants. ● Analyze the preferences of fast food and hobbies within groups, compare the data across groups, and make informed group decisions based on the collected data.			
Soft Skills	Problem-solving, critical thinking and networking	**Resources**	What Is Statistics: Crash Course Statistics #1 National Wages: 15-2041.00 - Statisticians National Wages: 43-9111.00 - Statistical Assistants Handouts: Survey Questions - Fast Food - one for each group Survey Questions - Hobbies - one for each group
Additional Materials ● Survey Questions - Fast Food handout , one for each group Survey Questions - Hobbies handout, one for each group ● Art supplies (glue, glitter, markers, paint, etc.) ● Pencils, paper, and scissors ● Computers for student use			
Icons	💭 **Activity**	✔**Check-In**	⟲ **Review**

PREPARATION

- View What Is Statistics: Crash Course Statistics #1 and prepare to provide simple explanations.
- Review the Instructional Support Guide and print/prepare referenced scaffolds.
- Print handouts.
- Familiarize yourself with O*NET
- Familiarize yourself with Skills to Pay the Bills, though it won't be used directly in this lesson.

INTRODUCTION (45 min)

Welcome students to the class!

Inform students that this lesson will introduce the theme to careers in statistics. Ask the question: *What is statistics?* and allow time for students to answer.

Play What Is Statistics: Crash Course Statistics #1 and pause as required to explain terms, key ideas and to answer questions. Provide a brief summary of the information in the video.

Have a few students summarize what intrigued them about the information presented and guide a short discussion about how statistics helps in our daily lives.

Highlight that the lesson will focus on two careers in statistics: Statisticians and Statistician Assistants. Explain how networking is an important soft skill in Statistics careers.

Introduce the objectives of the lesson.

Instructor Note: There is more time allotted to this section so you can explain the video in simpler terms to students.

VOCABULARY, READING & WRITING (30 min)

Project this short essay on and have students take turns reading it. Bring to notice how the information is organized and use this essay to also help students find meanings of words using context clues.

Problem-solving, critical thinking, and networking skills are crucial for statisticians and statistics assistants. These skills are vital in their roles, which involve working with data to find answers.

Statisticians are data detectives. They use problem-solving skills to **tackle** data challenges. For instance, when data is missing, they need to find ways to fill in the gaps. This might involve statistical techniques like **imputation**, where they estimate missing values based on existing data patterns. Additionally, they must address **outliers**, which are data points that significantly differ from the **norm**. Identifying whether these outliers are genuine data or errors requires problem-solving abilities.

Critical thinking helps statisticians make sense of data. They analyze information carefully to draw accurate conclusions and identify patterns. Critical thinking also involves evaluating the quality and reliability of data sources. Statisticians must critically assess whether the data they are using is trustworthy, as the accuracy of their analyses **hinges** on this assessment.

Networking skills are essential, particularly during data collection. Statisticians connect with other experts in related fields to broaden their knowledge and gain new insights. This collaboration allows them to learn from others' experiences, exchange ideas, and seek advice when facing complex data scenarios. For example, when conducting surveys, statisticians may collaborate with subject matter experts to ensure the questions are framed correctly and that the data collected aligns with the intended research objectives. Networking with these experts ensures that the data collected is both valid and relevant.

In summary, statisticians and statistics assistants rely on problem-solving and critical thinking to analyze data effectively. Problem-solving extends to handling missing data and outliers, while critical thinking involves evaluating data quality. Networking skills facilitate collaboration with subject matter experts during data collection, enriching the overall quality of their work.

💭 REFLECTION (15 minutes)

✔ Facilitate a discussion around these soft skills and have students contribute to why the skills are important using information from the essay.

Lower Level	Higher Level
Provide students more time for reading and help them with strategies to identify meanings of words that might be new for them as they read.	Encourage students to use the words in bold-print in sentences.

MATHEMATICS (45 min)

Review the concepts of visually representing data using graphs. Have students share what they remember about graphs and how they help them interpret data. Encourage students to share a bit about the type of graphs they are aware of and where graphs can be used.

Inform students that one of ways graphs can help us learn more about careers is by helping compare wages and employment trends across similar careers to help us make informed decisions.

Pair students up and share the following two links. Allow time for them to analyze both the graphs and the information presented. Then, ask the questions that follow and have them write down the answers with their partners. Discuss the answers after each question before you ask the next one.

- National Wages: 15-2041.00 - Statisticians
- National Wages: 43-9111.00 - Statistical Assistants

💭 REFLECTION (10 minutes)

✔Ask the following questions.

1. *How much do statisticians on average earn in the United States?*
2. *If you are a statistician earning $70,000, are you earning more or less than the average salary for statisticians in the United States?*
3. *How many statisticians earn $161,300 or more in the United States?*
4. *What percentage of statisticians in the United States earn less than $58,090?*
5. *What is the average salary for statistical assistants in the United States?*
6. *If a statistical assistant earns $55,000, are they earning more or less than the average salary for statistical assistants in the United States?*
7. *What percentage of statistical assistants in the United States earn $79,250 or more?*
8. *How does the average salary of statisticians compare to the average salary of statistical assistants in the United States?*

9. *Which group (statisticians or statistical assistants) has a wider salary range?*
10. *If you are a statistical assistant earning $60,000, are you earning more or less than the average salary for statisticians in the United States?*

Lower Level	Higher Level
Pair students with higher level students for this activity.	Encourage students to map this information as a scaled graph.

GROUP WORK (75 min)

Inform students that they will work in groups to practice the concept of collecting and analyzing data using fun and relatable topics such as fast food and hobbies.

Review the key points from the video used in the introduction about statistics and its applications, particularly how statistics can be used to answer questions about fast food consumption and hobbies. Emphasize the importance of collecting data to make informed decisions, even in everyday life.

Divide the class into four groups: Group 1, Group 2, Group 3, and Group 4. Explain that Group 1 and Group 3 will focus on fast food preferences, while Group 2 and Group 4 will focus on hobbies or favorite downtime activities.

Distribute the appropriate survey questions to each group based on their assigned topic. Suggest students to create a tabular format to capture the responses for each question. Instruct the groups to fill out the surveys within their group for the first 10 minutes. Then, have the groups switch survey forms with each other (Group 1 with Group 2 and Group 3 with Group 4). Encourage participants to be honest in their choices. Encourage students to use at least 4 questions from the survey form provided. They can opt to use all the questions.

Have groups collect the completed surveys for both fast food and hobbies respectively. Get them to discuss the following within their groups:

- *Which fast food items/restaurants or hobbies/activities are the most popular among our groups?*
- *Are there any surprises in the data?*
- *What can we learn from this data about our groups' preferences?*

Recall the terms "descriptive statistics" and explain that what they've done is a basic form of data analysis to summarize the group's preferences for both topics.

💭 REFLECTION (15 minutes)

Discuss with the whole class how this data might be used to make decisions, such as choosing a restaurant for a group outing or planning a group activity based on common hobbies.

✔ For fast food preferences, involve Group 1 and Group 3 in making a decision about where to order food for a future group activity. For hobbies preferences, involve Group 2 and Group 4 in planning a group

activity based on the common hobbies or activities identified in the survey. Have the groups share their findings to help make these decisions.

Highlight how statistics can be used in everyday decision-making and group activities.

INDEPENDENT WORK TIME (30 min)

Share https://www.onetonline.org/link/result/43-9111.00?c=dw&c=sk&n_sk=10&s_sk=IM&c_sk=0 with students and allow 15 minutes for them to read through the detailed work activities and skills related to statistician assistants.

Once students have finished reading, instruct them to write a short paragraph about:

1. What they understand about statistics in their own words
2. Which parts of the job activities interest them the most and explain why.
3. Identify which skills needed for this job match their current skills.

Walk around and help students with sentence starters or other edits as required.

Lower Level	Higher Level
Provide sentence starters.	Challenge students to write a few sentences on where they can apply the knowledge about statistics from this lesson to help them make decisions in their lives.

WRAP-UP & REFLECTION (15 min)

Encourage students to share how they can use the statistical knowledge gained from this lesson to help them in making life decisions.
Summarize the key points of the lesson.

Distribute exit slips to students.
Ask for a few volunteers to share their reflections.
Collect and review the answers.

Survey Questions- Fast Food

1. What is your favorite fast food restaurant?
2. Which type of fast food do you enjoy the most (e.g., burgers, pizza, tacos)?
3. How often do you eat fast food in a week?
4. When you visit a fast food restaurant, what menu item do you usually order?
5. Are you more likely to dine in, take out, or use delivery services for fast food?
6. What is the main factor that influences your choice of a fast food restaurant (e.g., taste, price, convenience)?
7. Do you have any dietary restrictions that affect your fast food choices?

Survey Questions- Hobbies

1. What is your favorite hobby or downtime activity?
2. How often do you engage in your favorite activity in a week?
3. Who do you usually enjoy this activity with (e.g., friends, family, alone)?
4. What equipment or materials do you need for your favorite hobby?
5. Do you have any specific goals or achievements related to your hobby?
6. How long have you been pursuing this hobby, and what inspired you to start?
7. If you could try a new hobby or activity, what would it be, and why?

Reflection Exit Slip

In one sentence, describe what you learned in this lesson.

Today, I learned _____.

Is one of the careers discussed today of interest to you? Why or why not?

I liked / did not like _____ *career because*_____

_____.

Is there anything you still need help understanding?

What's one question you have?

Circle the emoji that shows how you feel about your mastery of content in this lesson.