EVERFI

Curriculum Guide

Data Science Exploration: Banking Fraud

Recommended Grade Level: 9th-12th graders in the U.S. and Canada

Total Time: *2 modules, approx. 15-20 minutes each*

Subject Fit: Economics, Mathematics, Statistics, College/Career Prep

Standards Alignment: Common Core Standards in Statistics and Probability, International Standards for Technology in Education (ISTE) Standards

COURSE OVERVIEW

The *Data Science Exploration: Banking Fraud* spoke is a 201 course dedicated to providing upper high school students with the skills and knowledge they need to accurately evaluate the ROI of data science education and career options specifically within the banking industry. It will refresh learners on some core concepts from the Data Science Foundations course and introduce them to the role data science plays in the banking industry, including:

Risk

- Fraud detection
- Risk modeling

Marketing & user experience

- Customer support
- Chatbots
- Customer segmentation

Automation

- Automated reporting
- Automated processes

Ethical Considerations

- Information privacy/confidentiality

TOPIC AREAS

Data Science

- Students will discover ways data is used in various applications and how the emerging field of data science is growing rapidly. The module will explore data categorization, cleaning and validation, and visualization. Students will understand how data is used in critical decision making.

Banking Fraud

- Students will explore the ways in which fraud affects financial institutions and their customers and how financial institutions use data to combat it.

Employment in the Banking Industry

- Students will discover the outlook for various data science positions within the banking industry.

Automation

- Students will learn about the use of machine learning to automate processes such as data collection, analysis, fraud detection and prevention.

Ethics

- Students will understand the importance of ethical behavior in data science, such as avoiding using data to lie or manipulating data. They will also learn about keeping personal data confidential.

Customer Experience

- Students will discover the importance of maintaining good customer experiences while preventing fraud.

COURSE STRUCTURE

Each module is accompanied by offline lesson plans and discussion guides to use in the classroom.

DETAILED COURSE OUTLINE

Module 1: Data Science in the Banking Industry

The purpose of this module is to equip upper high school students with the skills and knowledge they need to accurately evaluate the ROI of data science education and career options, specifically within the banking industry. The module will cover core concepts of data science in banking, including risk prevention, process automation, customer experience, and ethics.

Learning Objectives:

Students will be able to...

- Describe the methods used to collect, analyze, visualize, and communicate data.
- List examples of how data science is used to prevent risk in the banking industry.
- List examples of how data science is used to create improved processes and automation in the banking industry.
- List examples of how data science is used to improve customer experience in the banking industry.
- Describe specific ethical considerations for data science in the banking industry.

Activity Topic	Activity Description
Working in the Banking Industry	Students review the basics of data science including collecting and cleaning data, visualizing data, analyzing data, and reporting on data.
Data Science Roles in Banking	Students take a close look at the roles and responsibilities of data scientists, data engineers, and data analysts.
Data Science Applications in Banking	Students explore how banking institutions use data to drive decision-making in order to minimize risk, maximize customer experience and automate processes.

Module 2: Banking Fraud Simulation

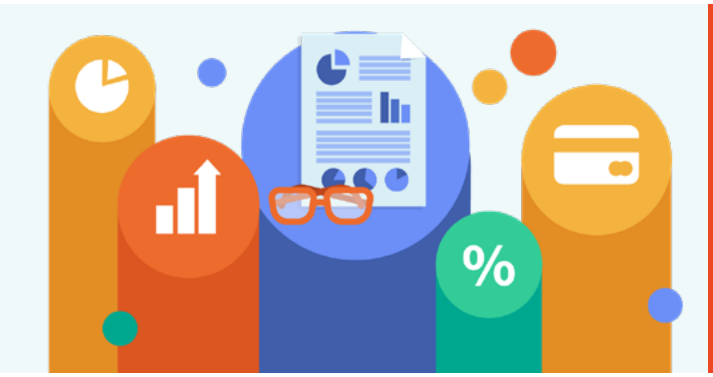
Students will discover how fraud in financial transactions is detected and mitigated. Students will determine when risk of fraud is highest and how steps are taken to prevent fraud.

Learning Objectives:

Students will be able to...

- List examples of how data science is used to prevent risk in the financial industry.
- List examples of how data science is used to create improved processes and automation in the financial industry.
- Define and demonstrate how to use a decision tree.
- Define and demonstrate how to use a confusion matrix.

Activity Topic	Activity Description
Fraud in Banking	Students will take a close look at fraud in the banking industry and understand that it costs financial institutions billions of dollars per year.
Preventing and Detecting Fraud	Students will explore how data scientists prevent and detect fraud using regression analysis, logistic regression, threshold values, and confusion matrices.
Data Trends	Students will learn how data trends help workers in the banking industry to study, detect, and prevent fraudulent purchases.
Identifying Cases of Fraud and Not Fraud	Students will understand how automated processes can differentiate between cases of fraud and not-fraud.



EVERFI

Curriculum Guide

Data Science Exploration: Financial Wellness

Recommended Grade Level: 9th-12th graders

Total Time: *2 lessons, approx. 15 minutes each*

Subject Fit: Mathematics, College/Career Prep, STEM, Technology, Business, Homeroom, Finance, CTE

Standards Alignment: Common Career Technical Core Standards (CCTC), Common Core National Standards: High School Statistics and Probability (CCSS Math), International Society for Technology in Education Standards (ISTE), Jump$tart National Standards for Personal Financial Education (2017 and 2021)

COURSE OVERVIEW

The *Data Science Exploration: Financial Wellness* course is a 201 course designed to be taken after learners complete Data Science Foundations. This course will include a brief refresher of core data science concepts, an introduction to data science within the banking industry, and a simulation exploring how data scientists can target specific financial wellness solutions to a young adult population. This course will also give learners the ability to accurately evaluate the ROI of data science education and career opportunities within the banking industry.

TOPIC AREAS

- Risk detection
- Marketing and user experience
- Machine learning and automation
- Ethical considerations in data science
- Identifying negative financial behaviors and decisions
- Customer segmentation and determining ideal timing for advice
- Data mining for trends
- Creating and manipulating graphs
- Financial wellness for newly financially independent adults

COURSE STRUCTURE

Each lesson is accompanied by offline lesson plans and discussion guides to use in the classroom.

Lesson: Data Science in the Banking Industry	Pre-Assessment		**Lesson:** Financial Wellness	Post-Assessment	Post-Survey

Key Learning Objectives:

Students will be able to...

- Describe the methods used to collect, analyze, visualize, and communicate data.
- List examples of how data science is used to prevent risk in the banking industry.
- List examples of how data science is used to create improved processes and automation in the banking industry.
- List examples of how data science is used to improve customer experience in the banking industry.
- Describe specific ethical considerations for data science in the banking industry.
- Define and demonstrate how to use data mining techniques.
- Define and demonstrate how to segment customers based on specific characteristics.
- Identify common financial challenges faced by newly independent adults and how to overcome them.

DETAILED COURSE OUTLINE

Lesson: Data Science in the Banking Industry

The purpose of this lesson is to equip upper high school students with the skills and knowledge they need to accurately evaluate the ROI of data science education and career options, specifically within the banking industry. The lesson will cover core concepts of data science in banking, including risk prevention, process automation, customer experience, and ethics.

Learning Objectives:

Students will be able to...

- Describe the methods used to collect, analyze, visualize, and communicate data.
- List examples of how data science is used to prevent risk in the banking industry.
- List examples of how data science is used to create improved processes and automation in the banking industry.
- List examples of how data science is used to improve customer experience in the banking industry.
- Describe specific ethical considerations for data science in the banking industry.

Activity Topic	Activity Description
Working in the Banking Industry	Students review the basics of data science including collecting and cleaning data, visualizing data, analyzing data, and reporting on data.
Data Science Roles in Banking	Students take a close look at the roles and responsibilities of data scientists, data engineers, and data analysts.
Data Science Applications in Banking	Students explore how banking institutions use data to drive decision-making in order to minimize risk, maximize customer experience and automate processes.

Lesson: Data Science Exploration: Financial Wellness

The purpose of this lab is to expand upon the concepts in the Banking Industry lesson by allowing learners to practice and apply data science concepts to identify financial wellness solutions for common issues faced by young adults.

Learning Objectives:

Students will be able to...

- List examples of how data science is used to create improved processes and automation in the banking industry.
- List examples of how data science is used to improve customer experience in the banking industry.
- Define and demonstrate how to use data mining techniques.
- Define and demonstrate how to segment customers based on specific characteristics.
- Identify common financial challenges faced by newly independent adults and how to overcome them.

Activity Topic	Activity Description
Story set-up	Learners meet a character they'll follow through the lesson as he learns how to use online banking to manage his money.
Financial Wellness and New Adults	Learners are introduced to the common financial problems and pitfalls for newly independent adults. They will explore ideal financial behavior. Learners will practice segmenting customer data by age and life stage.
How Data Scientists Use Data to Provide Advice	Learners will review solutions to common financial problems and pitfalls. They will identify ideal timing for delivering information, as well as best messaging and delivery methods for information and products.
Testing and Validating Messaging	Learners will apply automated processes to get messages to the right customers, and evaluate how well the process worked.