



5-E CLASSROOM STEM ACTIVITY:
ACCOUNTING FOR EXPENSES

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ACCOUNTING— MORE THAN SPREADSHEETS AND CALCULATORS

BY SUE HAMILTON



CHANDREA WINTON
SENIOR ACCOUNTANT
DEGREE: BACHELOR'S IN ACCOUNTING
YEARS IN THE INDUSTRY: 16

There's a reason "accountant" is probably the first job most of us think of when asked about a career that uses a lot of math. Accountants are necessary for every company to run smoothly, taking care of things like payroll (something important to all employees), taxes, leases, utilities, investments, and more. Smaller companies often use accounting services to help them keep their records straight, while larger companies employ an entire staff of accountants to manage their financial empires.

We often picture accountants as being bookish and able to do crazy calculations quickly in their heads, but you don't have to be a math whiz to be successful in the financial industry. If you're comfortable with numbers and enjoy solving puzzles, accounting might be the right field for you.

Chandrea Winton was one of those kids who excelled at math even in grade school. She liked working with numbers and problem-solving and built on those

strengths to become a senior accountant with FedEx in Collierville, Tenn.


After 16 years in the industry, Chandrea is proud of her senior-level position. She has a bachelor's degree in accounting, and is working toward a master's degree to further her advancement. Hands-on experience working with an accountant as a part-time accounting clerk in college was good preparation for her future, Chandrea explains. "I assisted with preparing accounting statements, reconciled numbers, and learned other accounting processes."

Students interested in accounting should do the same, Chandrea advises, to get exposure to this STEM career. "Even the minimal exposure to accounting can help in building a career in the field."

Chandrea uses STEM skills such as mathematics, problem-solving, analysis, and communication in her current role in lease accounting. She explains that attention to detail is very important as

she reviews lease documents between FedEx and property owners to confirm that they are in compliance with accounting rules and company policies. She also ensures that correct expenses are recorded in accounting statements each month, analyzes increases or decreases in total monthly rent amounts, and solves any discrepancies related to the amounts being recorded.

"Being able to solve problems and help revise processes to make them more efficient is the most rewarding part of my job," said Chandrea. But she also gives credit to the company that she works for. "I am proud to be working for a company that cares about people, not only their employees, but also people within the community."

If you think a career in finance could be right for you, help your family create a budget and balance your checkbook to gain practical, relevant experience that will serve you well in life and in any career you choose. 

5-E CLASSROOM STEM ACTIVITY: ACCOUNTING FOR EXPENSES

Here are some ideas for how middle school teachers could use this story as a launching point for integrated STEM learning. Our activities follow the 5-E Learning Cycle Model.



Part 1: Engage

- ① Teacher will discuss/brainstorm with students:
 - a. What careers come to mind when you think of jobs working with money?
 - b. In your own words, what do accountants do?
 - c. How could setting up a budget help in day-to-day life and in a career?
- ② Have students read the article "Accountants - More Than Spreadsheets and Calculators" in the late spring issue of *STEM Jobs* magazine.



Part 2: Explore

Students will work together in pairs to develop and analyze a monthly budget for 3 consecutive months. Together they will first make predictions as to what a starting monthly income might be for an accountant. They will then try to determine how much money will be necessary for the following expenses based on their own ideas and experience, not research:

- Housing
 - > Do you own or rent? What is the monthly payment based on housing prices in your region? What will you pay for utilities such as gas, electric, water, waste management, cable/internet?
- Transportation
 - > Are you paying for a vehicle?
 - If so:
 - > What type of vehicle will you drive?
 - > What are the monthly payments?
 - > What kind of gas mileage does the vehicle get?
 - > What do you think your monthly gas cost will be?
 - > How much is the average car insurance payment for your vehicle each month?
 - If not:
 - > What public transportation options exist?
 - > What is the monthly cost associated with your preferred method of transportation (subway, bus, taxi, Uber, etc.)?
- Communication
 - > Do you have a cell phone? How much is the monthly cell phone plan including fees?
- Essentials
 - > How much will you spend on food and other household necessities?
- Non-Essentials
 - > How much can you set aside for miscellaneous expenses? Consider things like:
 - Restaurants and coffee shops
 - Movies and entertainment
 - Shopping (clothes, gifts, etc.)
 - Vacations and travel
 - > What should you save for emergencies? Consider things like:
 - Car repair
 - Doctor/hospital bills
 - Home repair

Tell students to remember to include as many expenses as they think you will encounter. Encourage them to consult others who make these payments regularly to make educated guesses on what should be allocated to each category for a reasonable budget.

Next, have students set their estimated budgets aside and begin work on researching *actual* incomes and expenses. (The classroom teacher can choose to collect the initial budget projections so as to ensure that students are not editing their estimates as they go along). Students should only refer to their projected budget to ensure the income and expenses they're budgeting for are the same.

They will repeat the process outlined above with actual, research-based figures to create a more realistic budget. Encourage students to be as specific and accurate as possible, including the items they use every day (shampoo, toilet paper, toothpaste, etc.) in their household expenses. The expenses students research and record should be specific to their region. View local stores or websites for actual prices of foods and other household essentials. Remember to include any taxes that would also be added into the expenses (sales tax, property tax, etc.). The key is to be as specific and accurate as possible.

After listing expenses, have students research income. What type of accountant will you be? What is the annual **starting** income for someone in that field in your region? Where did you find that information and how do you know it's accurate? Based on the annual salary you found, how much would you make each month after having taxes, health insurance costs, etc. taken out?

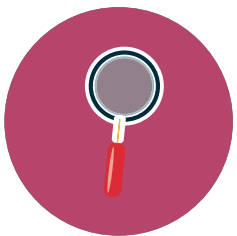
After completing their research, students will compare the actual information with their predicted numbers. What was close? What surprised them? Based on the income, are the expenses doable? Does something have to be adjusted? Do things need to be cut out? Is there enough left over each month for non-essentials and unexpected expenses?

What math needed to be used in figuring out a budget? How did you determine the monthly income? How did you calculate tax?



Part 3: Explain

The pairs will present their findings to the class. Each student in the pair will be responsible for contributing to the presentation. Budgets will need to be displayed on spreadsheets which can either be printed out and displayed on poster board or viewed online using Google Sheets. Students can and should also include images of the expenses. Include images of the housing or vehicle or general images of grocery items. Presentations should be visually appealing. Any and all calculations that were completed need to be included.



Part 4: Elaborate

Have students think about how a budget would be the same or different for a business/company. What other expenses would need to be considered (paying employees, legal fees, supplies, travel, licenses, etc.)? Would a budget be more or less important for a business than a family? Why or why not? Students will discuss these questions first in their pairs, then share their ideas in a full class discussion.



Part 5: Evaluate

Students will be evaluated for their project and presentation using the following rubric. Students will be provided the rubric at the start of the assignment to aid in the completion of the project. Each group will be graded, therefore all students in the group will receive the same score.

Scoring Rubric

___ /5 **Participation**

Did both members of the team contribute? Is there significant research and data to support that each member did their part?

___ /10 **Project Budget**

Did the students complete a **thorough** projected budget, with reasonable income and expense projections?

___ /15 **Research**

Was significant research completed? Is there adequate data? Are actual costs and incomes provided and explained? Is the provided financial information relevant to the overall project?

___ /10 **Visual Aid**

Is the information displayed in a visually appealing way? Is it neat and organized? Are the budgets well compared and explained? Are pictures included and relevant to the overall theme of the project?

___ /10 **Calculations**

Were necessary calculations performed and completed accurately to include all costs?

___ /10 **Presentation**

Did the presentation cover all areas of the process? Was the presentation clear and easy to understand?

___ /60 **Total**

Individual students will also submit a brief essay reflecting on their own contributions to the project and their thoughts on the importance of keeping and managing a budget. How are budgets beneficial? What was something new or unexpected that was discovered during the research of actual incomes and expenses? This reflection essay can be graded for completion or as a formal writing assignment toward each student's overall total.

Standards Addressed:

Common Core State Standards – Math

CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them.
CCSS.MATH.CONTENT.6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
CCSS.MATH.CONTENT.6.RP.A.3.B Solve unit rate problems including those involving unit pricing and constant speed.
CCSS.MATH.CONTENT.7.RP.A.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
CCSS.MATH.CONTENT.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.

Cross-Curricular Connections

CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.
CCSS.ELA-LITERACY.SL.6.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.6.1.C Pose and respond to specific questions with elaboration and detail by making comments that contribute to the topic, text, or issue under discussion.
CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.
CCSS.ELA-LITERACY.SL.6.5 Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.
CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.7.1.C Pose questions that elicit elaboration and respond to others' questions and comments with relevant observations and ideas that bring the discussion back on topic as needed.
CCSS.ELA-LITERACY.SL.7.1.D Acknowledge new information expressed by others and, when warranted, modify their own views.
CCSS.ELA-LITERACY.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.
CCSS.ELA-LITERACY.SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.
CCSS.ELA-LITERACY.SL.8.1.D Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.
CCSS.ELA-LITERACY.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.
CCSS.ELA-LITERACY.SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

Texas Essential Knowledge and Skills – Math

6.1.A apply mathematics to problems arising in everyday life, society, and the workplace
6.1.D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
6.1.E create and use representations to organize, record, and communicate mathematical ideas
6.14.H compare the annual salary of several occupations requiring various levels of post-secondary education or vocational training and calculate the effects of the different annual salaries on lifetime income
7.1.A apply mathematics to problems arising in everyday life, society, and the workplace
7.1.D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
7.1.E create and use representations to organize, record, and communicate mathematical ideas
7.4.D solve problems involving ratios, rates, and percents, including multi-step problems involving percent increase and percent decrease, and financial literacy problems
7.13.A calculate the sales tax for a given purchase and calculate income tax for earned wages
7.13.B identify the components of a personal budget, including income; planned savings for college, retirement, and emergencies; taxes; and fixed and variable expenses, and calculate what percentage each category comprises of the total budget
8.1.A apply mathematics to problems arising in everyday life, society, and the workplace
8.1.D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate
8.1.E create and use representations to organize, record, and communicate mathematical ideas
8.12.F analyze situations to determine if they represent financially responsible decisions and identify the benefits of financial responsibility and the costs of financial irresponsibility