

TIES 2003

Teachers in Industry for Educational Support

Technology Gurus Multi-grade Levels

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Table of Contents

	<u>Page</u>
Curriculum Unit Overview - narrative	3
Summary Chart	4
Section One (Technology)	5
Section Two (Language Arts)	13
Section Three (Math/Science)	17
Transfer Activity (Title)	#
Appendix (include handouts, worksheets, data sheets, references, relevant websites, books, articles, or organizations that may serve as student or teacher sources of information or materials)	#

Technology Gurus Curriculum Unit Overview

Summary

This module is a cross-curriculum unit that is designed to introduce students to the link between technology (Excel, Access and Power Point) and other subject areas: Language Arts and Math/Science. These skills are the basis for making intelligent decisions and are essential for students to succeed in a fast changing technological driven society. As written, the math/science and technology is most appropriate for 5th through 8th grade. The language arts component was written for the primary grade level: 1st-3rd.

Big Picture

Students will learn and understand how technology plays a role in everyday life. Students will learn this through Language Arts, Math/Science, and specific types of Technology.

Preparation for the Unit

- Language Arts: will require
- Math/Science activities were created with the idea that the students have already worked with Microsoft Excel and Microsoft Power Point. The teacher must be familiar enough to be able to teach both Microsoft Excel and Microsoft Power Point.
- Technology activities were created to give a basic understanding of Excel, Access, and Power Point and its uses in the classroom. The teacher must be familiar enough to be able to teach each of the above mentioned.

Overview

On the following page is a summary of the unit including brief summaries of each Authentic Learning Task (ALT). This table provides an overview of the tasks in the unit sections and shows how the activities in the different teaching areas relate to each other.

Technology Gurus Curriculum Unit Summary

Technology Software Application	Language Arts	Math/Science
<p>ALT 1 - Microsoft Excel Spreadsheet Setting up a spreadsheet with appropriate columns, entering data, applying equations to each column, and graphing data. Create/modify a database relevant to an assignment.</p>	<p>ALT 1 - Matching Students will match the name to the proper item.</p>	<p>ALT 1 – Science Experiment Groups of students will perform an experiment using the scientific method. While completing the experiment, students will compile their data in a spreadsheet.</p>
<p>ALT 2 – Microsoft Access Database Learn database vocabulary and uses. Introduction to creating a database. Create a database relevant to student interest.</p>	<p>ALT 2 – ABC Order Students will sort class names and put them in Alphabetical order.</p>	<p>ALT 2 – Science Experiment Presentation Groups of students will create a PowerPoint presentation as a means to communicate information about their science experiment.</p>
<p>ALT 3 – Microsoft PowerPoint Presentation Introduction to PowerPoint and basic operations. Demonstrate innovative used for PowerPoint. Design, create, and modify a usable slideshow.</p>		<p>ALT 3 – What’s Your Grade Students will use their individual assignment grades to compare mean, mode, median, and range with the help of technology.</p>
<p>Transfer or Culminating Activity</p> <p>Briefly describe the Transfer Activity and how it connects and expands upon competencies learned in the ALTs.</p>		

Section One: Software Application

ALT One: Microsoft Excel Spreadsheet

Summary

Grades 5 - 8

Activity #1

Students will be given laptop computers or take students to a computer lab. It is important that each student have a computer. Students will learn the basics on how to use a spreadsheet.

- Students will learn the appropriate vocabulary for understanding the use of a spreadsheet
- Students will follow step-by-step directions to create a spreadsheet
- Students will be shown how to manipulate data in successive columns and learning simple operational features, (adding, alphabetizing, graphing)

Activity #2

Students will increase their knowledge in learning to use a spreadsheet by creating a spreadsheet relevant to their interest or a classroom assignment.

Competencies

1. The learner will select and use technology tools to collect, analyze, and display data.
2. The learner will apply basic computer operations and concepts.
3. The learner will demonstrate basic knowledge and skills in the use of a spreadsheet.
4. The learner will create/modify a spreadsheet relevant to a classroom assignment.

Time

Activity #1 – 1 hour, 30 min.

Activity #2 – 2 hours

Materials

- Set-up laptops, or reserve computer lab dates
- Video projector/screen or TV/Computer connection

- White board
- Set of sample spreadsheets/copies for students
- Spreadsheet vocabulary list/copies for students
- Activity #2: copies of assignment: “Heat Tracking Activity in my Classroom”

Instructions

Activity #1

1. Students will discuss spreadsheet vocabulary and examine a model
2. Students will be given a laptop
3. Students will start up Excel
4. Students will be given a small set of data
5. Students will be shown how to manipulate data four times
6. Students will be shown how to add, alphabetize, and graph data
7. Students will print practice pages and file in portfolio

Activity #2

1. Students will be given their spreadsheet assignment in Science titled: “*Heat Tracking in my Classrooms*” (prior to software application lessons, this data will have been collected by students for five days in cooperation with classroom Science teachers)
2. Students will design and create a spreadsheet using data
3. Students will input data by teacher’s name, room number, days, and temperatures
4. Students will alphabetize, calculate average, and select an appropriate graph
5. Students will print Activity #2 final, edited version and file in portfolio

Evaluation/Assessment of Student’s Competency

Students will be assessed by the teacher using:

- conferencing with each student,
- checking results of Activity #2
- recording a grade in the grade book
- grade computer skills portfolio

Closure

Students are encouraged to reflect and synthesize...A spreadsheet is like a???

Compile their sentences and give students time to share these sentences. The sharing is important as it helps all students understand the concept/definition of a database from different perspectives. The reflection process will further student knowledge of selecting and using technology tools to collect, analyze, and display data.

Section One: Software Application

ALT Two: Microsoft Access Database

Summary

Grades 5 – 8

Activity #1

Students will be given laptop computers or take students to a computer lab. It is important that each student has a computer. Students will learn the basics on how to use a database.

- Students will learn the appropriate vocabulary for understanding the use of a database
- Students will follow step-by-step directions to create a database
- Students will be shown how to use information located in database files to create/modify a personal product

Activity #2

Students will increase their knowledge in learning to use a database by creating a database relevant to their interest or a classroom assignment.

Competencies

1. The learner will select and use technology tools to collect, analyze, and display data.
2. The learner will apply basic computer operations and concepts.
3. The learner will demonstrate basic knowledge and skills in the use of a database.
4. The learner will create/ modify a database relevant to a classroom assignment and utilize this information by answering a series of questions.
5. The learner will demonstrate knowledge in the use of OCIS (Ohio Career Information System) to retrieve information.
6. The learner will have an understanding of the variety of job opportunities available in Science fields

Time

Activity #1 – 2 hours

Activity #2 – 3 hours

Materials

- Set-up laptops, or reserve computer lab dates
- Video projector/screen or TV/Computer connection
- White board
- Set of sample databases: student directory, phone book, author lists, etc.
- Database vocabulary list/copies for students
- Activity #2: copies of assignment: “Science Careers”
- Internet access
- OCIS (Ohio Career Information System) software on all laptops or computers

Instructions*Activity #1*

1. Students will discuss database vocabulary
2. Students will define or redefine the function and purpose of a database
3. Students will transfer knowledge of the database and relate it to everyday uses and purposes
4. Students will be given a laptop
5. Students will start up Access
6. Students will be given a small set of data to evaluate and input into a database with four different scenarios
7. Students will be shown how to manipulate data to meet specific needs or uses of the information.
8. Students will print copies of practice sheets and file in portfolio

Activity #2

1. Students will be given their database assignment titled: “Careers in Science.”
2. Brainstorm on the white board careers in the science field giving the students examples if necessary.
3. Explain that each student will be choosing a separate science career to research for the purpose of creating a database.

4. List on the white board the information you want them to look up:
 - a. Career name
 - b. Educational requirements
 - c. Experience requirements
 - d. Average salary range
 - e. Specific geographical location for this career
 - f. Related fields
5. Allow students ample time to find information and write it in table format. They need to edit work to be very specific. DATABASES are specific!
6. As a class show them how to fill in a blank template for their Science career information.
7. All students fill in their information individually.
8. Practice utilizing sort and search techniques.
9. Print final /edited copy of Database and file in portfolio

Evaluation/Assessment of Student's Competency

- Table of relevant information
- Finished, entered, and edited information on database
- Students will be assessed by the teacher using:
 - ❑ conferencing with each student
 - ❑ checking results of Activity #2
 - ❑ recording a grade in the grade book
 - ❑ grade computer skills portfolio

Closure

Students are encouraged to reflect and synthesize...A database is like a???

Compile their sentences and give students time to share these sentences. The sharing is important as it helps all students understand the concept/definition of a database from different perspectives. The reflection process will further student knowledge of selecting and using technology tools to collect, analyze, and display data.

Section One: Software Application

ALT Three: Microsoft PowerPoint

Summary

Grades 5 - 8

Activity #1

Students will be given laptop computers or take students to a computer lab. It is important that each student has a computer. Students will learn the basics on how to use PowerPoint program.

- Students will learn the appropriate vocabulary for understanding the use of the PowerPoint program
- Students will follow step-by-step directions to create a slide
- Students will be shown basic features of the PowerPoint program

Activity #2

Students will increase their knowledge in learning to use the PowerPoint program by creating a five slide presentation assignment

Competencies

1. The learner will select and use technology tools to collect, analyze, or display information.
2. The learner will apply basic computer operations and concepts
3. The learner will describe the basic functions of the PowerPoint program.
4. The learner will demonstrate basic knowledge and skills in the use of the PowerPoint program.
5. The learner will create/design a PowerPoint presentation relevant to a classroom

6. assignment.

Time

Activity #1 - 1 hour

Activity #2 - 2 hours

Materials

- Set-up laptops, or reserve computer lab dates
- Video projector/screen or TV/Computer connection
- PowerPoint vocabulary list/copies for students
- Have a short, enjoyable, age appropriate, PowerPoint presentation to share with students to open the lesson
- White Board
- Practice PowerPoint model/copies for all students
- Activity #2: copies of assignment: School calendar for the month

Instructions

Activity #1

Step-by-Step Procedures (Adjust by doing more or less according to grade level)

- Share the opener PowerPoint presentation
- Review the basic concepts regarding PowerPoint making use of the vocabulary list
- Discuss with students the ABC's of PowerPoint and how planning a presentation is vital to a good presentation
- Demonstrate one PowerPoint tutorial offered online for use at home (www.school.discovery.com/teachers/kathyschrock)
- Review the toolbars and icons needed to complete common tasks
- Start PowerPoint and create two slides together using basic functions and a prepared model to follow
- Allow students to finish the third slide on their own going around and giving one-on-one assistance
- Students who can move ahead allow them to create the fourth or fifth slide for practice
- Students will save the PowerPoint practice presentation

- Explain to students the print options for PowerPoint presentations. Have each student print practice slide show as a handout and file in their portfolio

Activity #2

- Students will be given their independent PowerPoint assignment: “Upcoming School Events”
- Pass out the school calendar for the month
- Students can choose any upcoming school event for that month
- Create/Design a PowerPoint presentation with at least five slides and no more than eight
- Have the ABC’s of PowerPoint posted in the room

ABC’s of PowerPoint:

A= appropriate topic,

B= Busy slides - too much information,

C= Consistent slides – limit font changes, color or transitions

- Assist students with any one-on-one questions as they proceed through the assignment(this will vary according to prior PowerPoint knowledge and grade level)
- Upon completion of slides shows allow time to present to the class
- Have students vote on the best slide show from all “upcoming school events” assignment and run across the Channel One system in the school for all to enjoy
- Students will print a 6 slide handout to file in computer portfolio

Evaluation/Assessment of Student’s Competency

Students will be assessed by the teacher using:

- conferencing with each student,
- checking results of Activity #2
- recording a grade in the grade book
- grade computer skills portfolio

Closure

Students are encouraged to reflect and synthesize...The PowerPoint program is like a???
Compile their sentences and give students time to share these sentences. The sharing is important as it helps all students understand the concept/definition of the PowerPoint

program from different perspectives. The reflection process will further student knowledge of selecting and using technology tools to collect, analyze, or display data.

Section Two: Language Arts

ALT One: Matching Summary

Students will find the name of the school and design a cover for their book.
Students will match the office staff to their pictures and title of job and put in their book.

Competencies

1. Students will learn how to match one to one with the name of their school to the picture of their school and office staff.

Time

60minutes. (30 minutes each day)
It will take two days to complete this part of the lesson.

Materials

Students will need pre-made spiral bound book, glue, crayons, colored pencils, markers, list of pre typed schools and pre-typed list of office names and staff, photos of office staff.

Instructions

1. Students will review the names of the schools and pick their school.
2. Students will glue the name and the picture on to the cover of their book.
3. Students will design the rest of the cover on their own.
4. Students will mark their cover with illustrated by followed by their name.
5. Students will place office staff in book by matching the picture to the name and then gling it into the book.

Day One Activity:

The students will design the over of their class book by finding thier school name and putting it on the cover of thier book. Then they will use various drawing tools to design thier cover. They will also make sure that they include in the design of their cover illustrated by followed by thier name.

Day Two Activity:

The studetns will be given pictures and names of the office staff. They are to match the names of the office staff to their names. Then they are to put them on the next two pages of thier books. Picture with name below or to the side. They will be shown an example of both ways.

Evaluation/Assessment of Student's Competency

Rubric at the end of project.

Closure

At the end of the lesson we will share our pages talk about the next step in making our class books. Discuss ABC order.

Section Two: Language Arts

ALT Two: ABC Order

Summary

Students will place the students name in ABC order and then place them in their book along with their picture.

Competencies

1. Students will learn how to put words into ABC order.

Time

60minutes (30 minutes per day)

It will take three days to complete this part of the lesson.

Materials

Students will need 3x5 index cards, pencils, pre-made spiral book from the day before, glue, pre typed list of students names, single pictures of each student.

Instructions

1. Review ABC order. Remind them to look at the 2nd and 3rd letter if names start with the same letters. Students the have the same name with the same spelling will have to use the 1st letter in the last name. (REVIEW WITH GAME)
2. Students will cut the names apart and stack and number them in the order that they will be put in the book.
3. Students will check their work and have a partner look at it.
4. Students will place names and pictures in the class book in ABC order matching the name to the picture and gluing them in the book.
5. Students will share books with the class and save for open house.

Day Three Activity:

Students will start off by reviewing the rules of ABC order and playing a game. They will be given a 3x5 index card and told to go write their first name followed by the first letter of their last name. Then they will sort themselves into groups by the first letter of thier name (A group, B group etc....) . We will start with the A's and have them stand up. We will put the A kids in order based by first names and talk about what to do since they all stat with A's. Then we have to look to the second letter of thier name. If they are the same then we need to look to the third letter of thier names. After we do the A's as a group then each letter group will discuss what order they need to be in. Then we will form the line and check it and discuss if we need to make any changes and why. The students will hold their name cards up so children can check the spelling of the names.

Day Four Activity :

We will review the game from day three. Then the students will be given a pre-typed lists of students names to cut apart and put in ABC order. They may work togehter and discuss any problems they have. Each student must place his/her group of names in ABC order from top to back when stacking them in the order they will be using them as they are finished. The stack must be checked by at least two peers. Then they may start glue them in ABC order in their book. Then they will go back and match the picture to each student and glue it on the same page.

Day Five Activity:

Finish up from day four. As the students get finished they may go to the floor to share with peers. After all students come to the floor then they will discuss any problems that they may of had when making the book and what they did to solve the problems.

Evaluation/Assessment of Student’s Competency

Rubric at the end of the project.

Closure

At the end of the lesson they will share their books and talk about how they knew what order to put the names in. They will discuss any problems that came up and how they solved them. We will discuss if the order would have changed if we had based it on last names instead of first names.

Class Book Rubric

Neatness (1)	Office staff (1)	ABC order (2)	Cover (1)	Total Points (5)	Comments

Grade Scale

5-S 4-S- 3-N 2-N- 1-U

Section Three: Math/Science

ALT One: Science Experiment

Summary

Groups of students will perform an experiment using the scientific method. While completing the experiment, students will compile their data in a spreadsheet.

Competencies

5.5.3 Use observations to explain and communicate the results of the experiment

5.5.4 Identify 1-2 variables in a simple experiment

5.5.6 Explain why results of an experiment are sometime different

6.5.1 Summarize how conclusions and ideas change as new knowledge is gained

Time

The amount of time needed will depend on the duration of observations to be taken.

Materials

Experiment Instructions

Materials for Experiment

Observation Log Book

** I have provided two different experiments in the appendix. 3-4 groups need to run each experiment for the closure discussion to be affective.

Instructions

1. Follow the experiment instructions.
2. Make your observations daily and record them in your Observation Log Book as required by the experiment. Observations should be detailed including descriptive words and measurements.
3. Complete the experiment write up using the principals of the scientific method (see appendix). Make sure to include the answers to the questions in the analysis section.

Evaluation/Assessment of Student's Competency

Student competency will be assessed and evaluated using a rubric (See Appendix).

Closure

After the class has completed the assignment, allow time for the groups to get together and discuss the results: How are the results the same and how are they different? Why are they the same or different?

Section Three: Math/Science

ALT Two: Science Experiment Presentation

Summary

Groups of students will create a PowerPoint presentation as a means to communicate information about their science experiment.

Competencies

5.5.3 Use observations to explain and communicate the results of the experiment

5.5.4 Identify 1-2 variables in a simple experiment

5.5.6 Explain why results of an experiment are sometime different

6.5.1 Summarize how conclusions and ideas change as new knowledge is gained

Time

The amount of time needed will depend on how literate your students are with power point. Expert users will need less time so you may want to require more from them. While Novice users will need much more time so you may want to require less from them. Therefore, you may want to use two different rubrics for the two different levels of knowledge. (See Evaluation/Assessment tool)

Materials

Completed science lab

Computer with Power Point

Index cards

Writing utensils

Instructions

1. Briefly review power point and how to begin. Before the students actually create their power point, decide how you want them to save the presentation. For example: drakea
2. Use completed science experiment (see ALT1), rubric (see Evaluation/Assessment), and index cards to create a written draft of the power point. Each card represents a different slide in the power point presentation. Using the rubric, create the rough draft on the index cards.
3. Once you have the rough draft created and checked using the rubric, begin creating the individual slides of the presentation in PowerPoint.
4. Once the slides have been created and again check, begin creating your transitions and add sound.

5. Create an overhead of you data in your spreadsheet and any graphs or charts you created in your science experiment. This will be used to facilitate a closure discussion about the experiment.
6. Practice your presentation out-loud: who is going to talk when. Do you understand what you will tell the class? You will present this to the class- be prepared!

Evaluation/Assessment of Student's Competency

Student competency will be assessed and evaluated using a rubric. You may have experts and novices in the same class. Therefore, you may want to use the enclosed rubric and edit it for your different levels of knowledge. (See Appendix)

Closure

After each experiment group has completed their presentation, as a class look at their spreadsheets of data and any graphs or charts (using the overheads that each group made). Use open ended questioning to compare and contrast them as a class. Develop reasons why they may be different- recommend what can be done so that all spreadsheets of data, graphs and charts are all the same. Do they all need to be the same? Why or why not?

Section Three: Math/Science

ALT Three: What's Your Grade?

Summary

Students will use their individual assignment grades to compare mean, mode, median, and range with the help of technology.

Competencies

Time

Approximately three hours will be needed to complete this activity.

Materials

Individual students grade for each assignment
Record Sheet for grades (See appendix)
Compile Sheet for activity (See appendix)
Computer with Microsoft Excel

Instructions

1. Students will use the Record sheet to record the assignment name and grade.
2. Students will begin to complete the Compile Sheet: student calculation section only.
3. Briefly review Microsoft Excel and how to begin. Before the students actually create their Excel, decide how you want them to save the file. For example: drakea
4. Students will create an Excel program where Column A is the title of the assignment and Column B is the grade received for the assignment. Column C will be labeled current grade.
5. As a class, come up with a formula that will allow the students find their average class grade after each assignment. The class will also determine how Excel will find the median, mode and range.
6. Students will finish completing the Compile Sheet: filling in the spread sheet data. They will also answer the included questions.

Evaluation/Assessment of Student's Competency

Closure

After the students have compiled their hand calculations and the information from the spreadsheet, have a class discussion comparing and contrasting their information. Develop reasons why the two sets of information may be different- recommend what can be done so that both sets of information are the same. Do they need to be the same?

(Unit Title) ALT One: Handout One

1.

Transfer Activity

Provide a complete detailed description of the transfer activity, similar to that provided for the authentic learning tasks (complete with preparation, materials required, estimated time to complete, guidelines for completing activity, and rubric or assessment methodology).

Appendix One:

Science Experiment Rubric

You will be graded based on content & scientific method using the criteria below:

Content & Scientific Method

- Title Page: experiment name, student names, school name, & date
- Introduction: purpose or problem, your current knowledge, hypothesis
- Materials & Procedure
- Observations: Log of observations
- Data & Graphs: list data in spreadsheet, create needed graphs and charts
- Results: summarize data (state in words what your data says)
- Analysis: answer questions
- Conclusion: What do you know now? How did it change? Talk about your hypothesis. Pose another question or problem to investigate the topic further.

Appendix Two:

Science Experiment Presentation Rubric

You will be graded using the criteria below:

- Content & Scientific Method
- Creativity: transitions, sounds & graphics
- Organization: logic, clearly understood, suitable to topic, coherent
- Spelling & Grammar

Content & Scientific Method

- Title Page: experiment name, student names, school name, & date
- Introduction: purpose or problem, your current knowledge, hypothesis
- Materials & Procedure
- Observations: Log of observations
- Data & Graphs: list data in spreadsheet, create needed graphs and charts
- Results: summarize data (state in words what your data says)
- Analysis: answer questions
- Conclusion: What do you know now? How did it change? Talk about your hypothesis. Pose another question or problem to investigate the topic further.

The rubric below will help you determine your grade on this assignment. I will use this exact rubric to assign your group a grade.

Name _____

Science Experiment Rubric

Criteria	Expert 3	Novice 2	Beginner 1
Title Page: ✓ Experiment name ✓ Student name ✓ School name ✓ Date			
Introduction: ✓ Purpose or Problem stated ✓ Your current knowledge of material ✓ Hypothesis stated			
Materials & Procedure: ✓ List all materials needed ✓ List complete procedure			
Observations: ✓ Create a daily Observation Log Book with dates and <i>detailed</i> observations			
Data & Graphs: ✓ List data in a spreadsheet ✓ Create needed graphs ✓ Create needed charts			
Results: ✓ Summarize data using words			
Analysis: ✓ Answer questions included in the analysis section of the experiment			
Conclusion: ✓ What do you know now about the material? ✓ How did it change? ✓ Talk about your hypothesis. ✓ Create a question or problem to investigate in the future			
Spelling & Grammar	No errors	Two errors	Five errors
Creativity: Included transitions, sounds and graphics	Included all three points	Includes two points	Includes one or no points
Organization:	Missing one point	Missing two points	Missing three or four

Appendix Four: What's Your Grade? Compile Sheet

Name _____ Date _____

Please complete the following:

Criteria	Student Calculation	Spread Sheet Calculation
Mean		
Mode		
Median		
Range		

Answer the following questions:

1. How does the student calculation of the mean compare to the spread sheet calculation?
2. How does the student calculation of the mode compare to the spread sheet calculation?
3. How does the student calculation of the median compare to the spread sheet calculation?
4. How does the student calculation of the range compare to the spread sheet calculation?
5. Evaluate the grades (mean, mode, median). Which is the most reliable? Explain.

6. Evaluate the grades (mean, mode, median). Recommend the grade that you would like to receive. Explain your recommendation.