This packet from 7th Grade will be used as a guide, but modified by individual 8th Grade Teachers.

Science Fair Folder
Table of Contents

* Scientific Paper to be separate and placed with display board for judges to review. (Student's name should not appear on this document)
**Papers to be created by the student to be placed in the folder

Keymakers

Some people see a closed door
And turn away.
Others see a closed door,
Try the knob,
If it doesn't open…
They turn away.
Still others see a closed door,
Try the knob,
If it doesn't open,
They find a key.
If the key doesn't fit…
They turn away.
A rare few see a closed door,
Try the knob,
If it doesn't open,
They find a key,
If the key doesn't fit…
They make one.

SUGGESTED TIME TABLE
CASTLE JR. HIGH SCIENCE FAIR PROJECT COMPLETION

Nov. wk. 1 _____ **Explanation of Science Fair – (Video overview)**
(Search for projects)
(Entry Form, Important dates, Requirements, and Set-up talk)

wk. 2 _____ **Explanation of Science Fair Folder**
(Begin folder work, tweaking Projects of interest)

wk. 3 _____ **Entry Forms Signed and Turned in – continued folder work**
(2) Category Science Fair Folder Evaluation forms completed

wk. 4 _____ **Project Chosen and Placed on Program –cont. folder work**
*** Have (3-5) topic search words ready to use for language class ***

DEC. wk. 1 _____ **Graphing Skills completed** – continued folder work
Research begins in Language Arts class (Start on *Oral Presentation*)

wk. 2 _____ **Materials gathered** and begin to set up the experiment.
(Start on Scientific Paper) – Write-up of Paper Towel experiment complete

wk. 3 _____ **Carry out the experiment** – allow time for mistakes
(Begin working on oral presentation to be given in class in January)
Write-up of Sweetner experiment complete

JAN. wk. 1 _____ **Carry out the experiment** – allow time for mistakes
(Continue working on oral presentation to be given in class in January)

wk. 2 _____ **Experiment completed & (*Oral Report* ready)**
(Rough draft of charts, diagrams, or data tables from your experiment)
(Begin Abstract – use instructions from Sci Fair folder)

wk. 3 _____ **Completed Scientific Paper &** (Abstract completed)
(Begin Planning the Display Board) (These are available in Sci classes for $5)
(Refer to **Display Plan Tips** sheet provided)
(Oral presentations given in Media Center)

wk. 4 _____ **Gather Display plan materials**
(Begin lettering! This could take longer than you think)
(Begin building the display) Mr. Mullen (Art Teacher) display board Power Point.

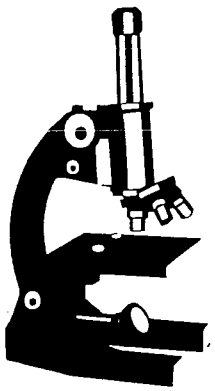
FEB. wk. 1 _____ **The Display Completed**
(Have a *plan for getting your project to and from school*)
See schedule for set-up times and tear down times

wk. 2 _____ **Science Fair Week - February,** 10TH, 11TH, 12TH

Castle North Middle School
7th grade

Science Fair

Important Dates
November 2009 –Review Science Fair guidelines and possible topics
December 2009 – Topic selected and experimentation begins
January 25-29, 2010 – Final report and display completed
February 10, 2010 – Display to school for judging
February 11, 2010 – Judging, Awards, and Open House
February 12, 2010 – Open house continued and projects sent home



The Castle North Middle School Science Fair is an opportunity for students to complete a long-term project, to schedule their time, to develop their own ideas, and to improve many academic skills. Students should get started early and do their best.

Standards
The state of Indiana has established seven teaching and learning standards for 7th grade students, and science fair activities address five of them:

Standard 1: ***The Nature of Science and Technology***
Students further their scientific understanding of the natural world through investigations, experiences, and readings. They design solutions to practical problems by using a variety of scientific methodologies.

Standard 2: ***Scientific Thinking***
Students use instruments and tools to measure, calculate, and organize data. They frame arguments in quantitative terms when possible. They question claims and understand that finding may be interpreted in more than one acceptable way.

Standard 3: ***Physical Setting***
Students collect and organize data to identify relationships between physical objects, events, and processes. They use logical reasoning to question their own ideas as new information challenges their conceptions of the natural world.

Standard 5: ***Mathematical World***
Students apply mathematics in scientific contexts. They use mathematical ideas, such as relations between operations, symbols, statistical relationships, and the use of logical reasoning in the representation and synthesis of data.

Standard 7: ***Common Themes***
Students analyze the relationships within systems. They investigate how different models can represent the same data, rates of change, cyclic changes, and changes that counterbalance one another.

Castle North Middle School
7th grade

Requirements

1. Students may work alone or with a partner; the partner must be in the same grade.
2. Project must be experimental, ***NOT a report or demonstration***. This means there must be an independent and dependent variable, and these variables should be measurable and compared to a control. The Science textbook has further information in the "Skill Handbook" section pages 684 – 692.
3. Students will use the scientific method and have a written report following these steps
   - I. Title
   - II. Purpose
   - III. Research
   - IV. Hypothesis
   - V. Materials Used
   - VI. Procedure
   - VII. Observations/Data
   - VIII. Conclusion
   - IX. Acknowledgements
4. Students must bring and display a project one day before the Science Fair.

Please note that only invertebrate animals can be tested. NO VERTEBRATE ANIMALS. Contact your Science teacher for the few exceptions to this rule.

Categories

All projects will be entered in a category for competition. The categories are:

- Behavioral and Social Science
- Biology (Botany and Zoology)
- Chemistry
- Medicine and Health
- Physics and Technology (engineering, computer, and math)
- Aero, Earth, and Space
- (8th Grade Only) **Team** (3-4 students – any of the above categories)**

Judging and Awards

All projects will be judged by individuals with an interest and expertise in the category they judge. These judges are volunteers and are not connected with Castle North Middle. Projects are judged from 9:00 am to 1:30 pm on the first day of the Science Fair. Projects must be assembled and displayed according to guidelines to be eligible for awards. First, second and third place ribbons will be awarded based on the number of entries in each category.

Each category in the 7th and 8th grade will have a grand prize winner who will receive a $75.00 savings bond. The overall winner for each grade will receive a $150.00 savings bond and a trophy. The Team Category for each grade level will not be eligible for bond awards. Other awards include: 1) the **Inspector Gadget Award**, given to the 7th and 8th grade project demonstrating the best use of a student-designed gadget in the experiment. This gadget cannot be a kit of any kind, and must be designed and build by the student; 2) The **VanGogh Award**, given to the 7th and 8th grade project demonstrating the best artistic talent in the display. 3) **Mathematics Award**, given to the 7th and 8th grade project demonstrating the best use of higher mathematics. Winners of these awards receive a special ribbon and a $75.00 savings bond.

For more information, contact the student's science teacher at Castle North Middle School.

**Team entries will compete against other entries from the same grade level.

Set-up Instructions

The Science Fair is in the front gym of Castle North Middle School. 7th grade projects are displayed on the north side and 8th grade projects on the south side. Teachers and volunteers will direct students and parents to the correct category areas. Parents should help the student by bringing all projects and display materials **Wednesday evening** prior to the Science Fair. Plan ahead for materials needed for set-up, such as scissors, tape, markers, etc.

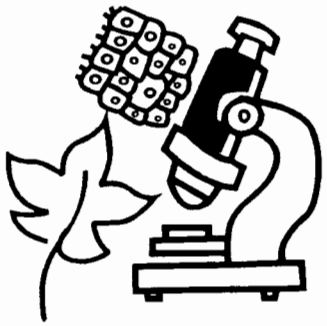
2010 Timetable

Wed, February 10,	2:30 – 6:00 pm	Projects arrive in gym and set-up
Thu, February 11,	7:00 – 7:30 am	Late-arrival projects to gym for set up
	9:00 am	Judging begins
	1:00 pm	Interviews for 1st place finishers
	No students are allowed in the gym during judging.	
	6:00 pm	Grand Awards ceremony in gym for Grand Award winners and families
	6:30 pm	Science Fair open to public until 8:00 pm.
Fri, February 12,	7:30 am – 1:00 pm	Science Fair open to the public
	1:30 pm – 5:00 pm	Projects removed from the gym

All projects must be removed from the school gym by 6:00 pm Friday, and parents are encouraged to pick up projects. Projects will not be allowed on buses. All projects and materials left at school after the deadline will be discarded.

*A very brief time is available Thursday morning from 7:00 – 7:30 am for projects that cannot be assembled on Wednesday evening. Due to spacing problems, please make every effort to bring the project here on Wednesday evening. Contact the student's science teacher as soon as possible if there is a problem.

Thank you,
Castle North Middle School Science Department



Castle North Middle School
Science Fair
Entry Form

Date: February 10 – 12, 2010 Place: Castle North Middle School

Exhibitor Name: _____ Grade: _____

Exhibitor Phone: (optional) _____ Science Teacher: _____

Project Title _____
(Subject to change up to the last week)

Place an "X" in the blank which represents your area of entry

_____ Behavioral and Social Sciences _____ Biology (Botany and Zoology)

_____ Health and Medicine _____ Chemistry

_____ Aero, Earth, and Space Science _____ Physics _____ Team

Parental Approval:

I certify that to the best of my knowledge, this exhibit will be completed by and will be largely the work of the student named above. Knowing that this project is a part of the Science curriculum I give my approval for the public display of the exhibit named above at the Castle North Middle School Science Fair February 10, 11, and 12. (See attached pages for further details)

_____

(Parent signature goes on the line above) **(Date)**

Will this project require electricity? (Circle one) Yes No
Will this project require Floor Space? (Circle one) Yes No

Return this form to your science teacher by: _____

If you have a partner or are part of a Team, please fill in the appropriate blanks

Name of Partner _____

Name of Team Members

_____

_____

WANTED: WINNING PROJECTS
SCIENCE FAIR PROJECTS *YOU CREATE YOURSELF*

SCIENTIFIC METHOD CHECKLIST

1. Base your idea for an experiment on an observation of *your interests.*
   List your interests: a. sports
   b. music
   c. fishing
   d. gardening
   e. pets
   f. electronics
   g. games (video, card, board)
   h. computers

2. Can you state *your purpose* from one of your interests? Usually the purpose of an experiment is stated in the form of a question. The purpose could be stated something like--- What is the effect of (your independent variable) on (your dependent variable)?

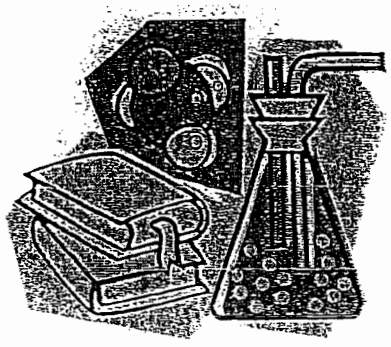
3. Do some *background research* to find what is already known about your topic. This may also help with a better purpose question or direction for the experiment.

4. *State your hypothesis*. This is an educated guess about what the results of your experiment will be from the purpose question.

5. *Form a detailed procedure* (step by step instructions) on how your experiment will work.

6. Follow steps 3-7 on the opposite page (Consider These Things) to determine if your project is a good one.

BEST PROJECTS HAVE SOME SOCIAL OR ECONOMICAL BENEFIT THAT COULD BE APPLIED TO IMPROVE THE QUALITY OF LIFE

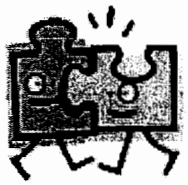


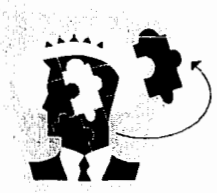
When searching for a Science Fair project consider these things:

1. Can you figure out **the purpose (problem)** that the project is trying to get you to understand and solve? This purpose (problem) needs to be in good question form.
2. Can you **form a hypothesis** (guess) as to what the outcome might be?
3. *Is the project an experiment??* Are there groups being compared? Can you identify these groups easily? Which of the groups is the **control**? Which of the variables is the ***independent and dependent variable?*** Can you determine which is which? AVOID MODELS AND OR DEMONSTRATIONS, (unless they are used to measure something) otherwise - THEY ARE NOT EXPERIMENTS!!!
4. What in the experiment is being measured (time, distance, height, mass, or counting numbers of something)? What ***units*** are being used to do the measuring? (seconds, centimeters, grams, etc...) METRIC UNITS should be used wherever possible. If nothing is being measured and compared to another group's measurements – It is not an experiment!
5. What **materials** are you going to need to conduct this experiment? Are they easy to obtain? Can substitutes for these materials be made?
6. **How long** will the experiment take? (hours, days, weeks) ? Will you have time for 10 or more trials? The number of trials is important!!
7. Are there charts, graphs, diagrams, data tables, or photographs provided to help **fill your display board**? If not, can you create some of your own?

IF YOU CAN ANSWER POSITIVELY TO THESE QUESTIONS YOU ARE WELL ON YOUR WAY TO A SUCCESSFUL SCIENCE FAIR!!!

Parts of an Experiment





Variables: the characteristics in an experiment that change or could be changed.

Independent variable: the variable you change on purpose; also called the manipulated variable.

Dependent variable: the variable that responds to a change in the independent variable; also called responding variable.

Hypothesis: an educated guess about how changing the independent variable will affect the dependent variable.

Constants: variables in an experiment that are kept the same in all trials.

Control: the standard for comparison in an experiment.

Trials: the number of times the experiment is repeated for each level, or value, of the independent variable. The more trials used, the more reliable your results.

Design an Experiment:
(A Paper Towel Dilemma)

Overview: Paper towels come in handy when you miss the glass while pouring milk. But do all paper towels absorb liquid equally? Design an experiment to find out. Then answer the questions below.

1. What is the **independent variable**? _____

2. What is the **dependent variable**? _____

3. What is the **problem** that is being solved in this experiment? _____

_____

4. State a probable (possible) **hypothesis**. _____

_____

5. List any **materials** you will need for this experiment. _____

_____

_____

✳ 6. ***On a separate sheet of computer paper*, write a procedure** for testing the hypothesis. The procedure should be so detailed that others would be able to follow the instructions precisely and as accurately as possible.

7. Identify a **control**. _____

8. What variables would be held **constant** (never change)? _____

_____

_____

✳ 9. ***Place on the same paper as the procedures*; a data table** for recording the the results of the experiment you have created. Identify the independent and dependent variables on the data table.

10. What kind of **graph** would you use to present your data? _____

(10)

SCIENCE FAIR PROJECT BACK-UP PLAN EVALUATION FORM

(From Mr. Wambach's Science World Project Data Base)
(Taken from a list in Science Fair Example Section of your notebooks)

1. What is the title and question (purpose) being asked of this project?

2. Who might benefit from knowing the answer to the problem (purpose) this project is trying to solve?

3. Identify the independent and dependent variables in this experiment.

   Independent:

   Dependent:

4. List or identify the remaining (constant) variables in the project.

5. What units of measurement are needed to conduct this experiment?

6. List the items or materials necessary to complete this project.

   a. d.
   b. e.
   c. f.

7. How much time do you estimate (figure) it will take to complete this experiment?

8. Draw or explain the charts, graphs ,diagrams, or other things you might use to display the results on a display board.

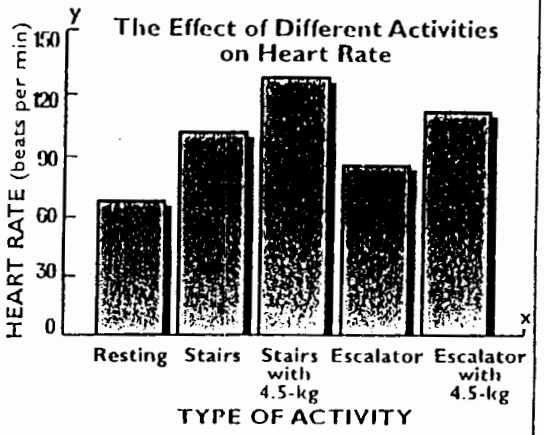
The Effect of Different Activities on Heart Rate				
Type of Activity	Heart Rate (in beats per minute)			
	Trial 1	Trial 2	Trial 3	Average
Resting	66	72	66	68
Climbing stairs	108	102	96	102
Climbing stairs with 4.5-kg weight	126	132	126	128
Walking up escalator	84	90	84	86
Walking up escalator with 4.5-kg weight	108	114	114	112

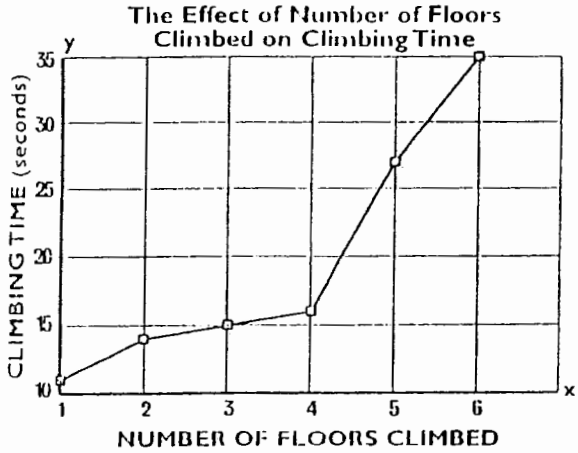
To make a data table:

1. On a plain sheet of paper, draw a data table as shown here.
2. Give your table a title that identifies your variables.
3. Label the column on the left as the independent variable (type of activity). Underneath, list each type of activity you used for the independent variable (resting, climbing stairs, etc.).
4. Label the columns to the right to track the dependent variable (heart rate). Draw boxes under these columns in which you can record the result of each trial for each activity.
5. Include a column to record the average heart rate for each activity. To calculate the average heart rate, add the heart rates for each activity, then divide the total by the number of trials.

To make a bar graph:

1. On graph paper, draw a set of axes (x and y).
2. Give your bar graph a title.
3. Label the horizontal (x) axis with your independent variable (type of activity), including the activities you used for the independent variable (resting, climbing stairs, etc.).
4. Label the vertical (y) axis with your dependent variable (heart rate) and a scale that marks the values of the dependent variable.
5. For each independent variable, draw a solid bar to the height of the corresponding value of the dependent variable. Example: The average heart rate at rest was 68 beats per minute. Draw a bar above the "resting" label on the x-axis to the 68 beats-per-minute mark on the y-axis.



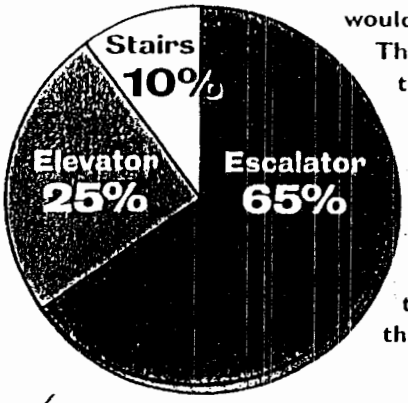


To make a line graph:

1. On graph paper, draw a set of axes (x and y).
2. Give your line graph a title.
3. Label the x-axis with your independent variable (number of floors climbed) and a scale with the values on the x-axis.
4. Label the y-axis with your dependent variable (climbing time) and a scale that includes all the values of the dependent variable.
5. Plot a point on the graph for each piece of data. Example: Your average time to get to floor 3 is 15 seconds. To locate this point in your graph, draw an imaginary vertical line from the floor-3 mark on the x-axis. Then, draw an imaginary horizontal line from the 15-second mark on the y-axis. Plot the point where the lines intersect. When you've plotted the points for all your data, connect the points.

To make a pie chart:

1. Draw a circle with a compass.
2. Give your pie chart a title.
3. Mark the center with a point; this is where each pie wedge will start.
4. Measure a wedge for each independent variable (stairs, escalator, elevator). First, convert your data from percentages to angle degrees. Example: If 25% of shoppers prefer the elevators, the pie wedge for elevators would be 25% of the 360° circle, or 90°. Then, position a protractor at the center point of the circle. Mark 0° and 90° angles with points on the edge of the circle. Draw a line from these points to the center of the circle.
5. Label the wedge (include its percentages).
6. Measure your next wedge from the edge of the first. When finished, the entire circle should be filled.



(12)

Name: _____

SOUND OFF

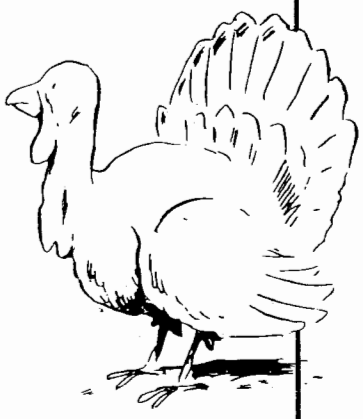
In "Turkey Time" (p. 12), you learned about how conservation measures—like stricter hunting guidelines—helped wild-turkey populations grow. How do scientists figure out if there is an increase of wild turkeys? By counting the number of gobbles they hear!

Each April, scientists in Indiana travel to different counties in the state to listen for turkey gobbles. They stop at several different locations within a county to count the number of turkey gobbles they hear. Then, they calculate to find the average number of turkey calls for that county. (For example: Scientists stop at two locations in one county. If they hear no turkey calls at one spot and one call at the other spot, the average wild turkey-gobbling count for that county will be 0.5.) If the average number of gobbles increases over the years, that means the population is exhibiting an *upward* (growing) trend. If fewer gobbles are heard, that means the population is showing a *downward* (decreasing) trend. Study the data table below to complete the activities that follow.

Average Wild-Turkey Gobbling Counts in Selected Indiana Counties

Year/County	Hickory	Morgan	Greene	Jefferson
1987	1.10	0.27	0.00	1.00
1991	0.33	0.33	0.07	1.07
1995	0.67	0.00	0.13	1.53
1999	0.80	0.67	0.40	1.20
2003	0.53	0.80	0.60	2.13

SOURCE: www.in.gov/dnr/fishwild/publications/notes/gobble.pdf



Part 1: Graph It!

Directions: On a separate piece of paper, construct a line graph for each county in the data table above showing the turkey-gobbling trends for the years featured. (**Hint:** Use a different-color pencil to represent each different county.)

Part 2: Analyze It!

Directions: Use the data table and your line graph to answer the following questions in complete sentences.

1. In the selected years, which county had the largest increase of wild turkeys?
2. In the given years, which county has shown only an upward trend in its turkey population?
3. Estimate the average number of turkey calls in Morgan County in 1997.
4. Which year had the greatest number of wild turkey calls? What does this trend suggest about the success of the wild-turkey populations in Indiana?

Take It Further

Research and report: Why do turkeys gobble? Also, compare the sounds of the adult male and the adult female turkey.

ANSWERS ON TE 7

Name: _____

OWL LEFTOVERS

You read in "Night Owl" (p. 12) that barn owls are ace in nabbing prey. What do they eat? A younger owl will sometimes eat 12 mice, while an adult will eat one large rat per night. Other prey that are on the owl's menu: shrews, moles, baby rabbits, frogs, lizards, insects, and birds.

Although an owl eats its prey whole, it cannot digest the animal's bones and hair. About 8 to 12 hours after eating its meal, the bird regurgitates an *owl pellet*, or a package consisting of bones and fur. You can learn a lot about an owl's feeding habits by analyzing the contents in these pellets. Students at Chinook Middle School in Lacey, Washington, dissected 184 owl pellets and compiled the data in the table below. Use the information to complete the following:

ANALYSIS: Calculate the relative abundance of each prey species to complete the data table. We did the first one for you.

Dissection Results for _____ Owl Pellets
(number)

PREY SPECIES	TOTALS	RELATIVE ABUNDANCE		
		Fraction	Decimal	Percent
Mice and rats	230	230/307	.75	79
Birds	3			
Shrews	21			
Voles	46			
Moles	7			
TOTAL PREY	307	1/1	1.0	100

1. Each owl's appetite differs. Suppose one owl produces one pellet per day. Use the information in the table above to calculate the average number of prey per day.
2. If the class dissected 700 owl pellets, based on the calculated relative abudance, how many birds would you expect to find?

GRAPH IT: On a separate piece of paper, use the above data to construct the following:

1. A bar graph showing the number and different types of prey species found in the pellets.
2. A pie chart showing the percentage of each prey species found.

CONCLUSION: On a separate piece of paper, answer the following questions in complete sentences.

1. What can owl pellets tell researchers about the owls that they study?
2. According to data collected by Chinook Middle School students, what are the owls' main prey species?
3. Which of the two graphs gives a reader the quickest and best sense of what the owls in this study ate? Explain your choice.

TAKE IT FURTHER: How do barn owls help farmers? Use the above data to support your answer.

ANSWERS ON TE 7

(ADAPTED WITH PERMISSION FROM SCIENCE AND MATH STAFF AT CHINOOK MIDDLE SCHOOL, LACEY, WA.)

Name: _____

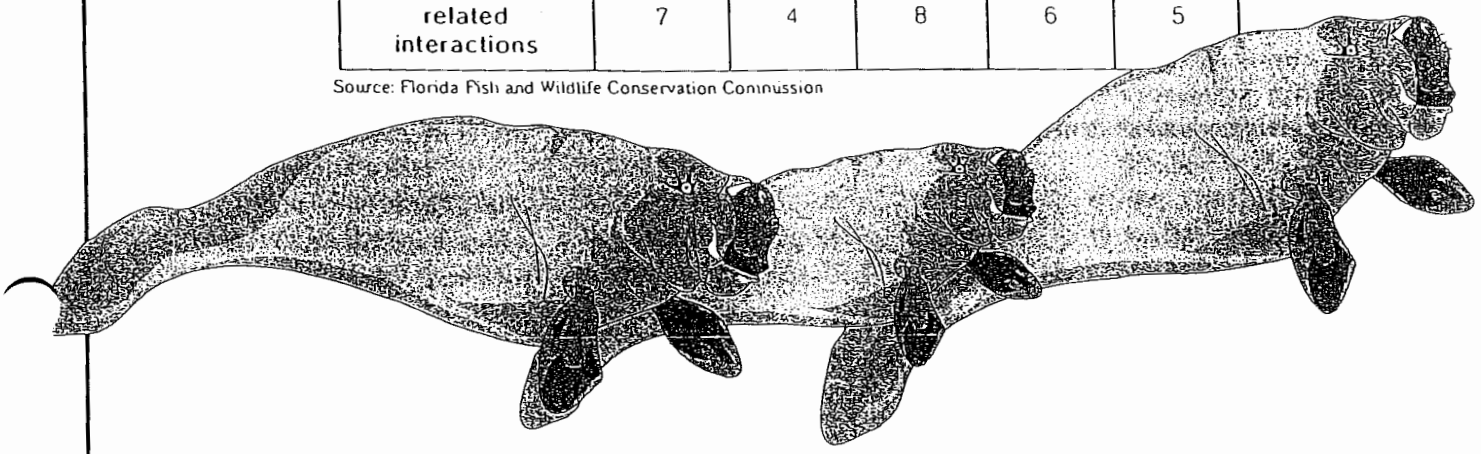
Manatee Count

In "High-Tech Rescue" (p. 8), you learned that many manatees die each year because of human-related activities, such as collisions with watercraft or crushing by canal locks. Complete this activity to learn more.

Number of Manatee Deaths Caused by Human-Related Activities

Cause of Death	2003	2004	2005	2006	2007
Collisions with watercraft	73	69	79	92	73
Crushing by flood gates or canal locks	3	3	6	3	2
Other human-related interactions	7	4	8	6	5

Source: Florida Fish and Wildlife Conservation Commission



PART A: GRAPH IT!

DIRECTIONS: Create the following on a piece of graph paper.

1. Create a bar graph comparing the different human-related causes of manatee deaths in 2007.
2. Generate a bar graph showing the total number of manatees killed as a result of human-related activities for each of the years featured on the chart. (**FOR EXAMPLE:** In 2003, there were 83 human-related manatee deaths.)
3. Create a line graph showing the number of manatees killed by collisions with watercraft between 2003 and 2007.

PART B: ANALYZE THE DATA

DIRECTIONS: Use the chart and your graphs to help you answer the following questions. Answer in complete sentences.

1. In which year did the greatest number of manatees die as a result of collisions with watercraft?
2. How many manatees died as a result of human-related activities in 2005?
3. In the first 4 months of 2008, 21 manatees died from collisions with watercraft. Supposing this rate stays constant, how many manatees will die as a result of watercraft collisions by the end of 2008?
4. How do you think the current energy crisis might affect the number of manatee deaths? Explain your reasoning.

ANSWERS ON TE 8

Science Fair Project
Oral Presentation Guidelines (Go in the order presented)

3=excellent 2=good 1=satisfactory

1. Title and Problem stated clearly _____
   (Include the Purpose for choosing this project)
   (Make a statement about how you came up with the idea)
   (Include who might benefit from knowing the results?)
2. Hypothesis clearly stated, constructed, and logical.
   (Logical means why you expect this result) _____
3. State the materials list completely
   Visual aides (Bring something to show where applicable) _____
4. Explain the procedures clearly and completely
   (Include how long the project will take or how long it took)
5. Use features to help the audience understand
   your project by using an appropriate **Demonstration.** _____
6. Identify the independent and dependent variables.
   Identify the **control group.** Describe what will remain
   constant (the same) during each trial. _____
7. Ask for questions and answered appropriately
   (If you do not know the answer to a question that is
   asked, simply state, " I don't know ".) _____
8. Confident delivery of the presentation (Followed the proper order)
   (Knows the material, has excellent presentation skills) _____
   (Good eye contact, voice quality, and enthusiasm)

NO Gum!!!!!!!!

****Any **Problems** that you had and solved or still need to work out.* ***(bonus)*** *** (1 – 3 possible additional points) _____

extra points maybe added or taken away if presenter has a ...

POSITIVE ATTIUDE +1 **NEGATIVE ATTITUDE -1**

TOTAL _____

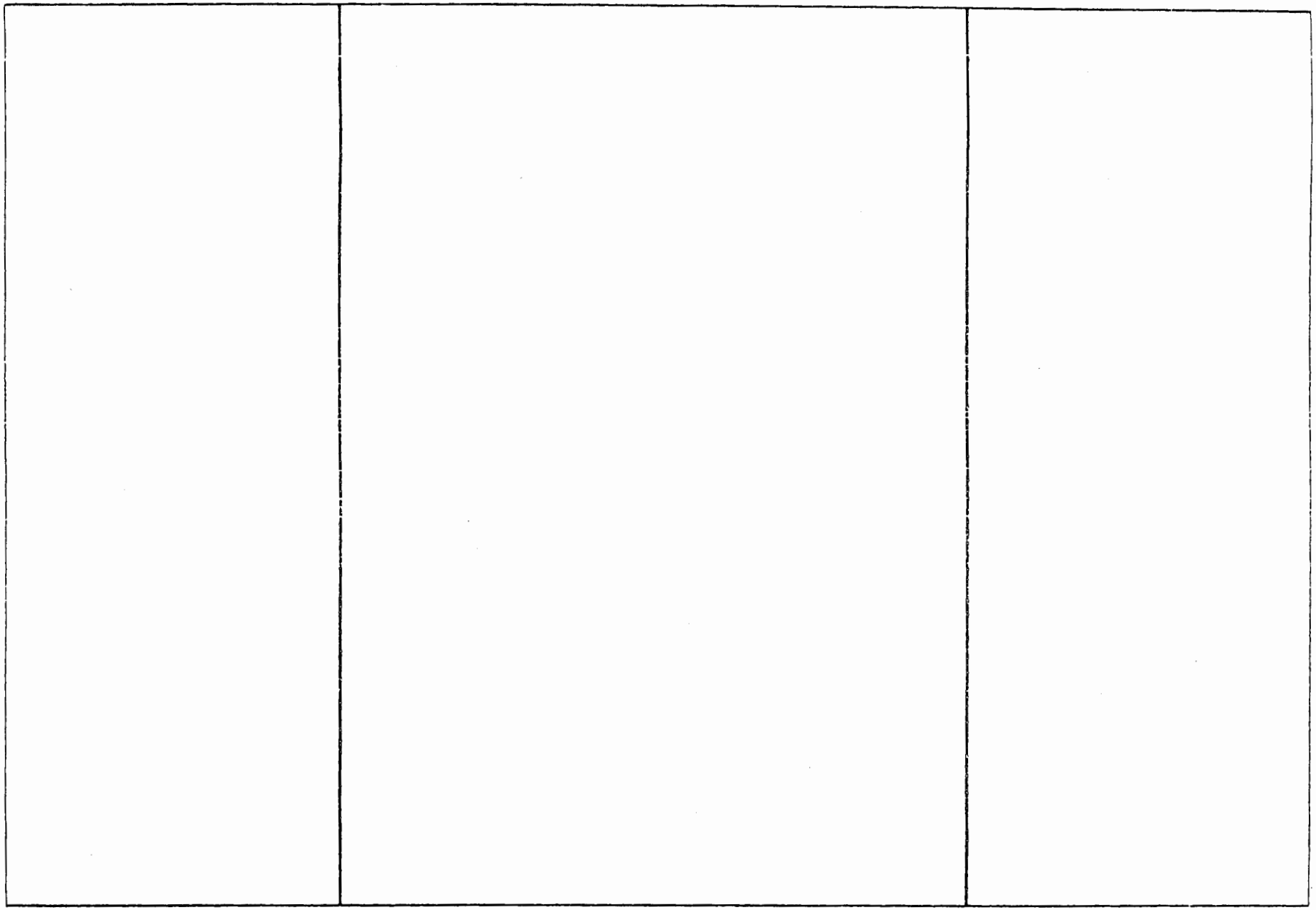
21 – 24 = A
18 – 20 = B
14 – 17 = C
10 – 13 = D
9 or below = N.P.

GRADE _____

panel one

panel two

panel three



(20)

Science Fair Display plan page one

ABSTRACT (250 words or less)

TITLE:
SCHOOL:
GRADE:

I. STATEMENT OF PURPOSE:
Briefly define your topic. What did you want to find out?

II. HYPOTHESIS:
State your hypothesis, or what you thought would happen in your experiment based on your knowledge of the topic.

III. METHODOLGY:
How did you test your hypothesis? List all materials you used. Identify all variables and controls. Explain your step-by-step procedure in enough detail so that another researcher would be able to repeat your experiment.

IV. ANALYSIS OF DATA:
Include a detailed summary of your data in text form. What did your charts and graphs show, especially regarding your hypothesis? *Make reference to the charts and graphs in the scientific paper.*

V. SUMMARY AND CONCLUSION:
What did you find out? Briefly explain how the data led you to accept or reject your hypothesis. Also describe any shortcomings of your study.

VI. APPLICATION:
Can you apply your research to the real world? Can your findings help people solve a problem? Do you have any suggestions for further research?

Abstract Example: Title: Effects of various fruit juices on plant growth
I. Matt wanted to know the effect of different juices on plant growth.
II. Matt thought all the plants would die when watered with juice.
III. To test the hypothesis Matt...- The materials Matt used were... - the independent and dependent variables are... the control in this experiment was .. Matt's procedures are...
IV. After a week and a half of observation, Matt found that plants fed with lemonade and grapefruit juice started to die, but those fed with orange juice grew taller that all the other plants.
V. Based on his results, Matt admitted that part of his hypothesis was wrong.
VI. Matt suggested that feeding plants orange juice on a regular basis could benefit agriculture and farming industries.

Keeping a Journal of the daily progress is highly recommended. This could also include problems encountered and the way in which they were solved. Parts of the experiment that were changed along the way to improve the project are good to record.

Name (Except for the Science Fair Paper)
Team and Period
Date
School

Scientific Paper 7th Grade

Title: The name of the project. (This should appear prominently on the display board).

Purpose: This would be the problem you are trying to solve in the form of a question or a comparative statement such as: (***If*** this occurs ***then*** this will happen). Included should be the reason(s) for needing to know the information you are providing and who specifically would benefit from the results of your findings.

Research: This is a report on information you gather about the main topic concerning your project. The report could be gathered from interviews of professional people, internet exploration, library reading, experienced experts, or other reliable sources. Try to find out what other people have done in this area of science and report on what they have found or what they understand about the subject. (December instruction in language classes will be provided)

Hypothesis: State a possible answer to the purpose question. (This is what is being tested in the experiment that you are conducting.)

Materials : List here all the material that was used during the experiment. Do not put this in paragraph form. Use an outline form.

Procedure: These are the step by step instructions on exactly how you will carry out the experiment. Anyone who would read these instructions could perform the experiment exactly the way you did. Be very descriptive here and clear about each step. Communication in this part is very important.

Data: Here you will place all the measurements collected during the experiment in the form of: tables, graphs, and (or) charts explaining the findings. It is very important to label effectively all the tables, graphs, and charts so that anyone could look at this section and understand the entire project. ***No*** *paragraphs* in this section only tables, graphs, and (or) charts.

Results: This is one of the most important parts of the entire paper. Try to include the following in this section:

- State whether or not the hypothesis you tested is **supported** or not. Use the data from your results to back up the hypothesis statement. (Example: The hypothesis was **supported** because after 10 trials the average for Group A was___; and the average for Groups B, C, and D were ____.)
- Explain or identify the independent and dependent variables. Especially identify which group was used as the **control**.
- Identify the **mean, median, standard deviation** and how they apply to the project.

Conclusion:

- Indicate the margin for error plus or minus from the unit of measurement that was used in the experiment.
- Identify any problems that might have occurred and were worked out during the experience.
- Suggest improvements to someone if they were to try this experiment
- Include what might be done if more time was given and this project was taken further.
- Who (Doctors, Farmers, Mothers with young children, or anyone) would benefit from learning of the results of this experiment. **This is a very important part of the paper**.

Acknowledgments: This is where credit to the sources used for the project is to be given. Also thank the people who helped with the project in any way.

Name_____Date_____Pd_____

Science Fair Research Paper Guidelines

Due Date:
Genre: Nonfiction
Assignment: Research Paper
Directions:

- Complete a research paper regarding your Science Fair Project.
- Your research paper must have an overall research topic, along with three subtopics to research.
- You will have four (4) days to conduct research (2 days in the library using a print source and 2 days in the computer lab for two online sources). If this is not enough time, you are strongly encouraged to continue research on your own via the public library and/or internet research at home. You will write your notes on Source Citation worksheets which will be provided.
- Your paper will be inserted into your science project paper for science class. You will submit a separate copy of your research paper to your language arts teacher. You should use a flashdrive to save all of your work. This way you can work from computers at home and school.

- You must turn in the following at the conclusion of your paper:
  (1) **Source Citation Worksheets** (where you will take your notes)
  Includes:
    - Minimum two (2) website sources (with authors)
    - Minimum one (1) print source (encyclopedia, book, magazine, journal, newspaper)

  (2) **Completed Formal Outline for your paper**
  (3) **Typed research paper:**
    - 12-14 pt.
    - Typewriter style font (Times New Roman, Comic Sans, etc.)
    - Minimum five (5) paragraphs: Introduction (including a well-formulated thesis statement), Body paragraphs, Conclusion (if you have several facts regarding your subtopics, your paper will be more than 5 paragraphs)
    - Cover Page
    - In-text Citations (**at least 7: 2 per body paragraph and 1 in either the introduction or conclusion)**

  (4)**Works Cited** (Bibliography) Page

Helpful Websites

- Inspire: www.inspire.net
  - Go to "Student Research Center" (second option on the left side).

- Google Scholar: http://scholar.google.com

- How Stuff Works: http://www.howstuffworks.com
  - Type key words in search box

- Son of Citation Machine: www.citationmachine.net
  - Choose your option in the left column
  - Type the information in the provided fields
  - Submit
  - Copy and paste citation in the box
  - Copy and paste in-text citation into paper

Example of a Works Cited Page

Textbook

Ballard, Robert D. "From Exploring the Titanic." Literature and Language. Evanston: McDougal Little, 1994. 94-105.

website with author

Carly, Richard. "Writing for You." The Writer's Nook. 23 March 2005. http://www.thewritersnook.com.

Encyclopedia

"Density." Academic American Encyclopedia. Danbury, CT: Grolier, Inc. 1998. 6th Edition. 113.

Book with more than one author

Rowe, Richard, and Larry Jeffus. The Essential Welder: Gas Metal Arc Welding Classroom Manual. Albany: Delmar, 2000.

Book with one author

Smaldino, Sharon. Instructional Technology and Media for Learning. Columbus, OH: Pearson, Merrill, Prentice Hall. 2005.

website with No author

"Writing a Paper." Library Spot. 17 January 2005. http://www.libraryspot.com/features/paperfeature.htm.

Other Tips for Creating Your Works Cited Page

1. "Works Cited" should be centered at the top of the page
2. Sources should be in **alphabetical order**.
3. If there is an author, the last name should always be listed first. If there is no author, then put the title of the article (in quotation marks).
4. Indent the second line of source citation
5. Put a period and a space after each major category.
6. Underline book, magazine, journal and newspaper titles.

Castle Jr. High School
2800 Hwy 261 – Newburgh, Indiana 47630

Science Fair

PROJECT SCORE SHEET

NAME OF PROJECT:

TOTAL SCORE:

1. CREATIVE ABILITY	Needs Improvement	Poor	Fair	Good	Out Standing	Total
Consider concept of theory and originality • Good questions being asked • Made good use of equipment • Made good use of own device for experimentation	1-2	3-4	5-6	7-8	9-10	
	Places of Improvement			Strong Points		

2. SCIENTIFIC THOUGHT	Needs Improvement	Poor	Fair	Good	Out Standing	Total
Consider interpretation and analysis of data Is this project an experiment using the scientific method? • Clear statement of the problem • Problem sufficiently limited • Variables clearly recognized • Proper use of control • Data adequate	1-6	7-12	13-18	19-24	25-30	
	Places of Improvement			Strong Points		

3. THOROUGHNESS	Needs Improvement	Poor	Fair	Good	Out Standing	Total
Consider problem coverage and apparent completion of the project • Is the conclusion based on appropriate number of trials? • Is it apparent that the amount of time spent on the project adequate? • Are these directions for further research or investigation?	1-6	7-12	13-18	19-24	25-30	
	Places of Improvement			Strong Points		

4. TECHNICAL SKILL	Needs Improvement	Poor	Fair	Good	Out Standing	Total
Consider craftsmanship, accuracy, and understanding of scientific terminology • Amount of work done by the subject • Was there a learning experience • Sources of equipment	1-2	3-4	5-6	7-8	9-10	
	Places of Improvement			Strong Points		

5. NEATNESS/DISPLAY CLARITY	Needs Improvement	Poor	Fair	Good	Out Standing	Total
Consider neatness, correct spelling, expression and eye appeal • Good use of verbal explanation • Good use of visual presentation	1-4	5-9	10-13	14-17	18-20	
	Places of Improvement			Strong Points		

(24)

Science Fair Project Evaluation

			Grading scale used
5 points	_____	Permission Form signed by deadline	23 – 25 A
5 points	_____	Backup Evaluation Plan	21 – 22 B
5 points	_____	Printed Timetable page that is checked off	18 – 20 C
5 points	_____	Graphing pages (Sound Off, Owl Leftovers, Manatee Count)	15 – 17 D
5 points	_____	Designing an experiment (Paper Towel Dilemma)	Below N.P.

ONE LETTER GRADE

25 points _____ Scientific Paper

Correct Headings, Title, Purpose, Hypothesis, Procedure	5 _____
Data section: Table and Graph Labeling, Number of trials	10 _____
Results: Hypothesis supported or not, variables, control	5 _____
Conclusion: Problems, improvements, further investigation, Who would benefit?	5 _____

ONE LETTER GRADE

5 points _____ Research background paper (This will be completed in your Language Arts class) The grade you receive will determine the Point value. A = 5, B = 4, C = 3, D = 2, and NP = 0

10 points _____ Oral Presentation in the Media Center (January 2010)

5 points _____ Display Plan (front) from drawing in the Science Fair Notebook

5 points _____ Abstract paper (Directions given in Science Fair Notebook)

ONE LETTER GRADE

25 points _____ Display board at the CNMS Fair

Overall Appearance (Colors, Balance, Neatness, eye appeal)	5 _____
Letter usage (Correct Spelling, well crafted, formality, balance)	5 _____
Creativity (Uniqueness of style)	5 _____
Communication	10 _____

Clear Purpose, Problem, or Question prominently shown
Hypothesis, and Conclusion clearly stated
Graphs, pictures, and Data tables well constructed and easily understood.
Interesting graphic art or colorful design that fit the theme of the project.
Will the viewer understand the experiment due to clear display?

TWO LETTER GRADES

(25)