



Discover Scientific Method 2010 Program Plan Guide and Resources for Implementation

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TEXAS SYSTEM INPUT

Outcome Plan Template: Discover Scientific Method

Plan originator: County Extension Agent

Plan Title: Discover: Scientific Method – XXXXXX County.

Program Area Category: Goal 9: Science Engineering, and Technology >>> Discover Scientific Method

Issue Source: Trend, Specialist Driven / RPD

Description: The Texas 4-H & Youth Development Program and state S.E.T. committee are excited to reveal the new Discover: Scientific Method program and poster contest for 2009. This program is based on science and the scientific method using the 4-H Science, Engineering and Technology (S.E.T.) model. The 4-H S.E.T. experience is a program that is framed in science, engineering and technology concepts. We would like to implement science, engineering and technology in the forefront of all 4-H project work. The Discover: Scientific Method program will allow youth to apply the scientific method to the subject matter they have learned through their 4-H projects. The scientific method is a process for experimentation that is used to explore observations and answer questions. Scientists use the scientific method to explore relationships in nature.

The poster contest will allow the youth an opportunity to display and explain through the scientific method their project, research and observations.

Target Audience: Youth

Start and End Dates: CEA develops

Program Goal:

To initiate a program based on science and the scientific method

To increase the awareness of science, engineering and technology among 4-H members

To implement science, engineering and technology in the forefront of 4-H project work using 4-H S.E.T.

Abilities:

To allow youth to apply subject matter they have learned through various projects and programs

Clientele Change: Behavior Change

Objective Indicators:

- develop an hypothesis,
- implement a research concept,
- career interest in science,
- public speaking,
- listening to others,
- complete obligations

Percent Time: CEA develops

Volunteers Involved: Yes

Collaborators: CEA develops

Planned Tasks

Task #1 – Planning Groups

Group (Committee Name): Completed by the CEA

Planning Group Type: Completed by the CEA

Nature of Meeting: Planning

Attended # of attendees: Completed by the CEA

Notes / Comments: Identify knowledgeable volunteers in community to lead project group work. Knowledge of scientific method, and teaching of science, engineering, and technology abilities and age appropriate educational activities to be identified.

Task #2 – Marketing / Promotion

Event Title: Marketing “Discover Scientific Method” to Appropriate Audiences

Type of Promotion: Completed by the CEA

Educational Method: Group

Notes / Comments: Marketing of Discover: Scientific Method should be announced to every 4-H member in the context of all 4-H educational activities associated with their chosen area has something based in the realm of 4-H SET.

Task #3 – Educational Methods

Event Title: Name the problem or question

Educational Method: Group

Group Method Type: In-person

Attended # of attendees: Completed by the CEA

Notes / Comments: Use of the Science Buddies web resources and the Intel ISEF Curriculum for after-school programs can be a resource for teaching questioning.

Task #4 – Educational Methods

Event Title: Form an educated guess (hypothesis) of the cause of the problem and make predictions based upon the hypothesis

Educational Method: Group

Group Method Type: In-person

Attended # of attendees: Completed by the CEA

Notes / Comments: Use of the Science Buddies web resources and the Intel ISEF Curriculum for after-school programs can be a resource for teaching questioning.

Task #6 – Educational Methods

Event Title: Test your hypothesis by doing an experiment or study (with proper controls)

Educational Method: Group

Group Method Type: In-person

Attended # of attendees: Completed by the CEA

Notes / Comments: Use of the Science Buddies web resources and the Intel ISEF Curriculum for after-school programs can be a resource for teaching questioning.

Task #7 – Educational Methods

Event Title: Check and interpret your results

Educational Method: Group

Group Method Type: In-person

Attended # of attendees: Completed by the CEA

Notes / Comments: Use of the Science Buddies web resources and the Intel ISEF Curriculum for after-school programs can be a resource for teaching questioning.

Task #8 – Educational Methods

Event Title: Report your results to the scientific community

Educational Method: Group

Group Method Type: In-person

Attended # of attendees: Completed by the CEA

Notes / Comments: Use of Research Poster Guidelines to develop the associated end product is to be used. Guidelines should be published and 4-H members made aware of the documentation and safety rules before they begin their Discover: Scientific Method project.

Task #9 – Educational Methods

Event Title: Science Fair Project / Celebration Event

Educational Method: Group

Group Method Type: In-person

Attended # of attendees: Completed by the CEA

Notes / Comments: Use of the National 4-H Recognition Model is highly encouraged to build a complete event recognition that is meaningful for the youth involved. The Intel ISEF Guide is the standard for most Science Fairs and should be closely reviewed for how an event should be coordinated.

Task #10 – Evaluation

Event Title: Evaluation of Discover Scientific Method

Evaluation Strategy: Retrospective Post

Data Collection Strategy: In Person Survey

Sampling Methodology: Census (all participants)

Will economic data be sought? No

Notes / Comments: Evaluation instrument has been developed for use.

Task #11 – Interpretation

Event Title: Interpret to Stakeholders

Type of Interpretation Event: Completed by the CEA

Notes / Comments: Completed by the CEA

PROGRAM RESOURCES

Information Related to Resources for Educational Methods

Name the problem or question:

http://www.sciencebuddies.org/science-fair-projects/project_question.shtml

http://www.sciencebuddies.org/science-fair-projects/parent_resources.shtml

<http://www.intel.com/education/tools/index.htm>

<http://www.intel.com/education/isef/>

http://www.societyforscience.org/isef/students/parent_tips.asp

Form an educated guess (hypothesis) of the cause of the problem and make predictions based upon the hypothesis

http://www.sciencebuddies.org/science-fair-projects/parent_resources.shtml#tc-scientificmethod

http://www.societyforscience.org/isef/students/scientific_method.asp

http://www.sciencebuddies.org/science-fair-projects/project_hypothesis.shtml

Test your hypothesis by doing an experiment or study (with proper controls)

http://www.sciencebuddies.org/science-fair-projects/project_experimental_procedure.shtml

http://www.sciencebuddies.org/science-fair-projects/project_variables.shtml

<http://www.intel.com/education/isef/middleschool.htm> Look to the middle right of web page for Download the Materials

Check and interpret your results

http://www.sciencebuddies.org/science-fair-projects/project_data_analysis.shtml

<http://www.intel.com/education/tools/index.htm>

Report your results to the scientific community

http://www.sciencebuddies.org/science-fair-projects/project_final_report.shtml

http://www.societyforscience.org/isef/students/scientific_method.asp

<http://d64-H.tamu.edu/4-hset/poster/>

PROGRAM EVALUATION

4-H SET initiative on the National level has a goal of one million new 4-H SET project completions by 4-H members by 2013. Texas 4-H SET will evaluate the usefulness of the 4-H SET Project Addendums to 4-H Projects and adjust training priorities accordingly. Discover Scientific Method will be evaluated on two tiers: 1) County Extension Faculty will evaluate the materials and the delivery to clientele; 2) 4-H members will evaluate their knowledge base of the scientific method, and the incorporation of SET into their 4-H Project work.

Evaluation Example:

Discover: Scientific Method

For each of the topics listed below, in the LEFT column, circle the ONE number that best reflects your LEVEL OF UNDERSTANDING before participating in the Discover Scientific Method Program. Then, in the RIGHT column, circle the ONE number that best reflects your LEVEL OF UNDERSTANDING after participating in the Discover Scientific Method Program.

LEVEL OF UNDERSTANDING

	Poor 1	Average 2	Good 3	Excellent 4				
Level of Understanding	<u>BEFORE</u> the Program		<u>AFTER</u> the Program					
My understanding of the scientific method concept	1	2	3	4	1	2	3	4
My understanding of the steps in the scientific method	1	2	3	4	1	2	3	4
My understanding of the what is a hypothesis	1	2	3	4	1	2	3	4

BEHAVIOR CHANGES

For the following behaviors, check the box that describes you as a result of participating in the Discover Science Method Program.

Behavior Change	Yes	No	Unsure
I have questioned things using the scientific method.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have developed an hypothesis to test a theory or an idea.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I have implemented a research concept using the scientific method.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am interested in a career in science.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am more comfortable with speaking with others because I have participated in the Discover Science Method Program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am more comfortable working in a team because I have participated in the Discover Science Method Program.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I will be more comfortable with serving leadership role (be a leader) because I have participated in the Discover Science Method Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am more willing to listen to others because I have participated in the Discover Science Method Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
I am going to do a better job of following through on obligations because I have participated in the Discover Science Method Program	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

What is the most significant thing you have applied because of the Discover Science Method Program (feel free to list more than one)?

Do you feel like what you learned provides you the ability to make better leadership decisions?

(Circle the best answer)

YES

NO

- Please explain your answer or provide an example.

Demographic Information

Gender: Female Male

Race: African American Asian American Native American
 White Other

Hispanic Ethnicity: Yes No

Age: 10 or younger 11 12 13 14 15 16 17 18 or older

Place of Residence: Farm Town Under 10,000 Town/City 10,000-50,000
 Suburb of city more than 50,000 Central City/Urban more than 50,000

Please provide any additional information on the back.