# 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08

Identify and create questions and hypotheses that can be answered through scientific investigations. \*Develop appropriate experimental procedures for: • Given questions. • Student generated questions. \*Analyze evidence to explain observations, make inferences and predictions. \*Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. \*Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.

What steps would you take to create a question that can be answered using the Science Method of Inquiry? (action plan)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan How Cool is Fire?

NAME:		Subject	t: Sciend	e .				
Date:		Grade I	Level (s)	: 6				
Standards/ Objectives A	ddressed (NCSCOS	S)						
1.01, 1.02, 1.04, 1.05, 1 Identify and create questions and appropriate experimental procedu explain observations, make infere hypotheses. • Evaluate how data conclusions of scientific investigat <b>Essential Question(s)</b> (In	hypotheses that can be res for: • Given question nces and predictions. * F fit. * Use oral and written ions.	is. • Student Prepare mode n language to	generated els and/or d	questions. * Analyze evidence to computer simulations to: • Test				
What steps would you ta Science Method of Inquir	•	estion tha	t can be	answered using the				
Assess (Look at student data	a to plan. Use formativ	e and/ or su	ummative	assessments.)				
Examine student readine	ess and mastery of	the Scie	ntific Me	ethod and process.				
High Yield Instructional	Strategies (check	all that a	apply to	the lesson)				
and differences p	Reinforcing effort and providing recognition Summarizing and note	repre	inguistic esentation	Setting objectives and providing feedback				
Questions, cues, and advance organizers✓Summarizing and note taking✓Cooperative learning✓Generating and testing hypothesesHomework and practice </td								
Learner Diversity • How will you different	iate to meet the needs	of all learn	iers in you	ır class?				
504 modifications ET and on remediation and enric		•		nd presentations will focus groups.	S			
Engage (Anticipatory Se • Capture the students' Consider novelty, mea	attention, stimulate th	ieir thinking	g and help	them access prior knowledge.				
Today we will examine fire, its properties and uses. We will apply these observations to create an experimental model to test our theories regarding fire.								
Instructional Practices U	Jsed in this Lessor	า						
Coaching	<ul> <li>✓ Providing Dir</li> <li>Instructions</li> </ul>			ng Centers				
Discussion	<ul> <li>✓ Providing opportunities</li> <li>practice</li> </ul>	for	Answe	ers	✓ ✓			
Hands-on experiences Presentation	Direct Instruct ✓ Testing		✓ Model ✓ Other	9	✓ ✓			

	act	ivities promoting the ab	ove	Instructional Practices	
Think-Pair-Share	✓	Instructional Games		Music/Rhyme/Rhythm/Rap	
Thinking Maps		Student Facilitators		Movement	
Technology Integration	✓	Storytelling		Humor	
Use of visuals	✓	Field Trips(Virtual)		Project/Problem - Based Learning	✓
Metaphor/Simile/Analogy		Reciprocal Teaching		Mnemonics	
Peer/Self Assessment	~	Drawing or illustrating	~	Other:	
Writing/Reflecting/Journals	~	Simulations/Role Play		Other:	
Type(s) of Grouping Used:small group_✓_studentExplain, Explore, Elaborate				_ <b>√_</b> individual	
<ul> <li>Involve students in an ana</li> <li>Use reflective activities to</li> <li>Give students time to thin</li> </ul>	dev Iysi clai k,p nity	ery 5-15 minutes to kee s of their explorations. ify and modify student t an, investigate and orga to expand and solidify t	pth unde anize	e students' brains engaged. erstanding.	or
See next page for instructio	nal	detail.			
	esso corir de u	ng guide (such as a rubri sed to be sure the stude	ic)a ntsa		
understanding? Cite evide support your view. • What caused the lesson to • What did you do to contrib	go go goute	of student work, perfor well? What challenges of to the lesson's effective	mar did y enes		

Date:	Time Frame: 40 minutes
	How cool is fire?
Essential Question:	What steps would you take to create a question that can be answered using the Science Method of Inquiry? (action plan)
Objective (s) Numbers:	1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08
Outcomes:	Identify and create questions and hypotheses that can be answered through scientific investigations. *Develop appropriate experimental procedures for: • Given questions. • Student generated questions. *Analyze evidence to explain observations, make inferences and predictions. *Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. *Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.
Materials:	one piece of flash paper, handkerchief, rubbing alcohol, lighter, candle, tongs <b>Preparation</b> : Create a solution (2 parts alcohol : 1 part water)
Anticipatory Set:	Today we will examine fire, its properties and uses. We will apply these observations to create an experimental model to test our theories regarding fire.
	During the Lesson
Presentation of Information:	
Integration of Other Subjects:	
Internation of Decision	Reading (prereading skills, vocabulary, dramatic presentation)
Integration of Reading: Integration of Technology:	Reading for information and interpretation. Computer, Projector, PowerPoint, Internet
Modeling:	Introduce the Science Method of Inquiry. Discuss the steps and assess the general knowledge of the group. Discuss the Safety Warning! This demonstration involves fire and should not be done by students or adults that have not practiced in advance.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Presentation:	http://www.science6.org/pdf/classroom/cool_fire.pdf
Guided Practice:	Assist the students through each phase of the Science Method. Pay special attention to the new concept - observation.
	After the Lesson
Independent Practice	Students will create an experimental abstract, analyze their data and draw conclusions regarding the experiment. Students will complete the conclusions section of the abstract while paying special attention to a future experiment that they would like to try.
	Advanced Learners will meet in cooperative learning groups to evaluate additional experiments and select the experiment that their learning group would fund.
Closure / Assessment:	Students will create a Science Method of Inquiry poster.

Integration with School-wide Focus: Improve Reading and Writing performance

- Materials:
  - $\circ$  one piece of flash paper
  - $\circ$  handkerchief
  - rubbing alcohol, lighter, candle
  - o tongs to hold burning handkerchief
- Preparation:
  - Create a solution (2 parts alcohol : 1 part water)
- Introduction:
  - **Safety Warning**! This demonstration involves fire and should not be done by students or adults that have not practiced in advance.
  - $\circ$   $\;$  Light the candle and begin to talk about the Science Method.
    - Question
    - Observe / Infer
    - Hypothesis
    - Procedures
    - Data
    - Analyze Data
    - Conclusions
  - Drop the flash paper onto the candle.
  - Ask a Question How cool is fire?
    - Have a few students share thoughts and ideas.
    - Students will inevitably conclude that fire burns stuff up let them know that the word they are looking for is consumes.
  - Remove the Handkerchief from your pocket, soak it in the alcohol solution, (wring it out), and set it on fire.
  - After the commotion dies down, say "This is the beauty of the Science Method! The conclusions step lets me think of another experiment...Since the fire didn't burn the cloth, I wonder if I can set my hand on fire without "consuming" the hair on the back of my hand?"
- Lesson:
  - Question: Can the teacher set his/her hand on fire without "consuming" the hairs?
  - Observations / Inferences: Students will record 4 facts about fire and 2 thoughts about the question.
  - Hypothesis: Students restate the question as an affirmative or negative statement.
  - Procedure:
    - dip hand into solution
    - apply fire
  - Data: Hair remained without singeing.
  - Analyze Data: Hair remained without singeing.
  - Conclusions:
    - Students state whether their hypothesis was proved or not proved.
    - Students discuss any problems that may have arisen.
    - Students write a sentence to discuss another experiment that this process leads them to want to try?

# 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08

Identify and create questions and hypotheses that can be answered through scientific investigations. \*Develop appropriate experimental procedures for: • Given questions. • Student generated questions. \*Analyze evidence to explain observations, make inferences and predictions. \*Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. \*Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.

What steps would you take to create a question that can be answered using the Science Method of Inquiry? (action plan)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan Magic or Science?

			Sub	oject: S	Scienc	е		
Date: Grade Level (s): 6								
Standards/ Objectiv	ves Addres	sed (NCSCOS)	)					
1.01, 1.02, 1.04, 1. Identify and create questic appropriate experimental p explain observations, make hypotheses. • Evaluate how conclusions of scientific in	ns and hypoth procedures for: e inferences an w data fit. * Us estigations.	eses that can be a • Given questions d predictions. * Pr e oral and written	. • Sti epare langu	udent ger models a	nerated o and/or co	quest ompu	ions. * Analyze evidend ter simulations to: • Te	e to
Essential Question(	S) (In stude	nt-friendly terms	s)					
What steps would y Science Method of I		•	stion	that c	an be	ans	wered using the	
Assess (Look at stude	nt data to pla	n. Use formative	and/	or sum	native a	asses	ssments.)	
Examine student re and review a few "c		•			fic Me	thoo	and process. R	ead
High Yield Instruct	ional Strate	egies (check a	all th	nat app	ly to t	he	lesson)	
Identifying similarities and differences		ing effort and g recognition	<b>`</b>	Nonlingu represen			Setting objectives and providing feedback	<b>`</b>
Questions, cues, and advance organizers Homework and practice	✓ Summar taking	izing and note	<ul> <li>✓</li> </ul>	Cooperat learning	tive	~	Generating and testing hypotheses	
504 modifications E	T and RA.		d as	signme	ents ar	nd p	resentations will	focus
on remediation and	0111101111101		u mi	jiiti at	mity y	roup		
Engage (Anticipato	<b>ry Set)</b> Jents' attenti	on, stimulate the					access prior knowle	dge.
Consider novelt Today we will exam Science Method of I how the Science Me	<b>ry Set)</b> dents' attenti y, meaning ar ine magic, nquiry to a ethod of Ind	on, stimulate the id emotion. its history an a magical hap quiry is used t	ir thi id th	nking an e scien ng to s	id help ice be	them hinc	l it. We will apply an better unders	y the
Engage (Anticipato • Capture the stur- Consider novelt Today we will exam Science Method of I how the Science Method Instructional Pract	<b>ry Set)</b> dents' attenti y, meaning ar ine magic, nquiry to a ethod of Ind	on, stimulate the id emotion. its history an a magical hap quiry is used t n this Lesson	air thi peni to he	nking an e scien ng to s elp us t	nd help nce be see if v	them hinc we c	l it. We will appl an better unders d our world.	y the
Engage (Anticipato • Capture the stur- Consider novelt Today we will exam Science Method of I	<b>ry Set)</b> dents' attenti y, meaning ar ine magic, nquiry to a ethod of Ind	on, stimulate the id emotion. its history an a magical hap quiry is used t n this Lesson Providing Dire	air thi peni to he	nking an e scien ng to s elp us t	id help ice be	them hinc we c	l it. We will appl an better unders d our world.	y the
Engage (Anticipato • Capture the stur- Consider novelt Today we will exam Science Method of I how the Science Method Instructional Pract	<b>ry Set)</b> dents' attenti y, meaning ar ine magic, nquiry to a ethod of Ind	on, stimulate the id emotion. its history an a magical hap quiry is used t n this Lesson	eir thi nd th peni to he	nking an e scien ng to s elp us t	nd help nce be see if v unders Learnir	them hinc ve c stan	l it. We will appl an better unders d our world.	y the tand
Engage (Anticipato • Capture the stur- Consider novelt Today we will exam Science Method of I how the Science Method Instructional Pract Coaching	ry Set) dents' attenti y, meaning ar ine magic, nquiry to a ethod of Ind ces Used i	on, stimulate the id emotion. its history an a magical hap quiry is used t n this Lesson Providing Dire Instructions Providing opportunities f	eir thi peni to he ction	nking an e scien ng to s elp us t s/ ✓	nd help nce be see if v unders Learnir Teache Answei Modelin	them hinc ve c stan	l it. We will apply an better unders d our world.	y the tand

Suggested brained-based learning	g act	ivities promoting the ab	ove	Instructional Practices	
Think-Pair-Share	~	Instructional Games		Music/Rhyme/Rhythm/Rap	
Thinking Maps		Student Facilitators		Movement	
Technology Integration	$\checkmark$	Storytelling		Humor	
Use of visuals	✓	Field Trips(Virtual)		Project/Problem- Based Learning	✓
Metaphor/Simile/Analogy	Ĺ	Reciprocal Teaching		Mnemonics	_
Peer/Self Assessment	✓	Drawing or illustrating		Other:	
Writing/Reflecting/Journals	~	Simulations/Role Play		Other:	
Type(s) of Grouping Used: small group _⊻_studen	t pa	irs _⊻_whole grou∤	D	_⊻_individual	
<ul> <li>Involve students in an an</li> <li>Use reflective activities to</li> <li>Give students time to thin</li> </ul>	/OU dev alysi clai k,pl inity	ery 5-15 minutes to kee s of their explorations. ify and modify student to an, investigate and orga to expand and solidify t	p the unde inize	e students' brains engaged. erstanding.	or
See next page for instruction	onal	detail.			
<ul> <li>Present students with a s</li> <li>What assessment(s) will</li> </ul>	corir <u>beu</u> disc	ng guide (such as a rubri sed to be sure the stude cuss their hypothese	ic)a ntsa	wer the Essential Question(s)? t the beginning to self-assess. are successful? Some of them want to try to	
understanding? Cite evid support your view. • What caused the lesson to • What did you do to contri	ence ogo bute	of student work, perfor well? What challenges to the lesson's effective	man did y nes		

Date:	Time Frame: 40 minutes
	Magic or Science
Essential Question:	What steps would you take to create a question that can be answered using the Science Method of Inquiry? (action plan)
Objective (s) Numbers:	1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08
Outcomes:	Identify and create questions and hypotheses that can be answered through scientific investigations. *Develop appropriate experimental procedures for: • Given questions. • Student generated questions. *Analyze evidence to explain observations, make inferences and predictions. *Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. *Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.
Materials:	white Styrofoam cup, "dry-lock"aka(Water Gel, Magic Powder, Sodium Polyacrylate), water, pencil
	<b>Preparation</b> : Carefully put 1 teaspoon of the "dry-lock" in the bottom of the Styrofoam cup. (You don't want any grains to be visible upon quick examination)
Anticipatory Set:	Today we will examine magic, its history and the science behind it. We will apply the Science Method of Inquiry to a magical happening to see if we can better understand how the Science Method of Inquiry is used to help us understand our world.
	During the Lesson
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Restating questions in declarative format) Reading (prereading skills, vocabulary, dramatic presentation) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet
Modeling:	Review the Science Method of Inquiry. Discuss Magic, Witches and Science. Today we will focus on the first 3 steps of the Science Method.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Presentation:	http://www.science6.org/pdf/classroom/magic_science.pdf
Guided Practice:	Assist the students through each phase of the Science Method. Pay special attention to questions, observations / inferences.
	After the Lesson
Independent Practice	Students will begin an abstract and practice the first 3 steps of the Science Method.
	Advanced Learners will meet in cooperative learning groups to evaluate hypotheses and select the hypothesis that their learning group would fund.
Closure / Assessment:	Students should share and discuss their hypotheses. Some of them want to try to develop procedures for testing their hypotheses.
Integration with School-wide For	cus: Improve Reading and Writing performance

#### • Materials:

- o white Styrofoam cup
- o "dry-lock" aka(Water Gel, Magic Powder, Sodium Polyacrylate)
- o water
- o pencil
- Preparation:
  - Carefully put 1 teaspoon of the "dry-lock" in the bottom of the Styrofoam cup.
- Introduction:
  - Discuss Magic, Witches and Science.
  - When we observe the natural world, questions arise that we want to discover the answers to! We can apply the Scientific Method of Inquiry to **try** to find out those answers.
  - $\circ$   $\;$  Today we will focus on the first 3 steps of this Method.
- Demonstration:
  - Show the students the empty cup. Walk around and let them glance in it nobody gets a "thorough inspection" because there are too many kids who must look at it. They are welcome to discuss this lack of thorough observation in the problems section of the conclusion.
  - Have a "brave" volunteer sit on a chair.
  - Fill the cup with 4-6 fl. oz. of water.
    - Play up the probability of "brave volunteer" getting wet! Sometimes I even pretend to call his mother and let her know that he will need a new set of clothes.
  - $\circ$   $\;$  Poke holes in the cup with the pencil.
- Lesson:
  - Question: (Students should wonder what happened to the water)
  - Observations / Inferences: Students will record details of the demonstration.
  - Hypothesis: Students restate the question and answer it with their idea.
- Applications:
  - Students should share and discuss their hypotheses. Some of them want to try to develop procedures for testing their hypotheses.
- Additional:
  - Don't tell the students what happened or show them how to do this. You may want to
    repeat this experiment later in the year when they are more skillful experimenters.

# 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08

Identify and create questions and hypotheses that can be answered through scientific investigations. \*Develop appropriate experimental procedures for: • Given questions. • Student generated questions. \*Analyze evidence to explain observations, make inferences and predictions. \*Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. \*Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.

There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. However, if time or funding were to limit your ability to make observations, which 2 observation techniques would you rely on?

(decision making)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan Observations Practice

NAME:					Scienc				
Date: Grade Level (s): 6									
Standards/ Objectives Ac		·							
1.01, 1.02, 1.04, 1.05, 1 Identify and create questions and appropriate experimental procedu explain observations, make infere hypotheses. • Evaluate how data conclusions of scientific investigat	hypothe res for: o nces and fit. *Use ions.	ses that can be ar Given questions predictions. * Pre- oral and written	. • St epare langu	udent g models	enerated and/or c	quest ompt	tions. *Analyze evidence to uter simulations to: • Test		
Essential Question(s) (In									
There are a variety of wa hypothesis and obviously that you will form a soun ability to make observati (decision making)	the m d hype ons, w	ore observa othesis. How which 2 obser	tion veve vati	s you er, if ti on teo	can ma me or f chnique	ake func s w	the more likely it is ling were to limit you ould you rely on?	Jr	
ASSESS (Look at student data	i to plan	. Use formative	and	or sun	mative	asse	ssments.)		
Examine student readine and review a few "observ		•			tific Me	tho	d and process. Read		
High Yield Instructional	Strate	gies (check a	all t	hat ap	ply to	the	lesson)		
and differences p Questions, cues, and ✓ S	oroviding	ng effort and recognition zing and note	<ul> <li>✓</li> <li>✓</li> </ul>	Nonling represe Cooper learnin	entation ative	<ul> <li>✓</li> </ul>	Setting objectives and providing feedback Generating and testing hypotheses		
· · ·									
Learner Diversity • How will you different 504 modifications ET and on remediation and enric	l RA.	Differentiated	d as	signm	ents ar	nd p	resentations will foc	us	
<ul> <li>Engage (Anticipatory Se</li> <li>Capture the students' Consider novelty, mea</li> </ul>	attentio		ir th	inking a	and help	then	n access prior knowledge	-	
Today we will examine the process and importance of observations and making observations.									
Instructional Practices U	lsed in	this Lesson							
Coaching	·	Providing Directions	ction	s/ 🗸	Learnii	ng Ce	enters		
Discussion	~	Providing opportunities f practice		~	Teache Answe		rected Questions and	✓ ✓	
Hands-on experiences	<ul> <li>✓</li> </ul>	Direct Instruct	ion	<ul> <li>✓</li> </ul>	Modeli			<ul> <li>✓</li> </ul>	
Presentation	$\checkmark$	Testing		$\checkmark$	Other:	Scie	ence6.org	$\checkmark$	

Think-Pair-Share       ✓       Instructional Games       Music/Rhyme/Rhythm/Rap         Thinking Maps       Student Facilitators       Movement         Technology Integration       ✓       Storytelling       Humor         Use of visuals       ✓       Field Trips(Virtual)       Project/Problem-Based Learning         Metaphor/Simile/Analogy       Reciprocal Teaching       Project/Problem-Based Learning         Metaphor/Simile/Analogy       Reciprocal Teaching       Phemors         Per/Self Assessment       ✓       Drawing or illustrating       Other:         Type(s) of Grouping Used:		<u></u> √	Instructional Games	ve Instructional Practices Music/Rhyme/Rhythm/Rap	
echnology       Integration       ✓       Storytelling       Humor         Ise of visuals       ✓       Field Trips(Virtual)       Project/Problem: Based Learning         Ideaphor/Simile/Analogy       Reciprocal Teaching       Mnemonics         teaphor/Simile/Analogy       ✓       Drawing or illustrating       Other:         virting/Reflecting/Journals       ✓       Drawing or illustrating       Other:         virting/Reflecting/Journals       ✓       Simulations/Role Play       Other:         Type(s) of Grouping Used:	hinking Mans		Student Facilitators	, , ,	
ise of visuals       ✓       Field Trips(Virtual)       Project/Problem- Based Learning         letaphor/Simile/Analogy       Reciprocal Teaching       Mnemonics         eer/Self Assessment       ✓       Drawing or illustrating       Other:         // fiting/Reflecting/Journals       ✓       Simulations/Role Play       Other:         // fiting/Reflecting/Simulations        Simulations/Role Play       Other:         // fiting/Reflecting/Simulations        Simulations/Role Play       Other:         // fiting/Reflecting/Simulations        Simulations/Role play          // fiting/Reflecting/Simulations/Role play        S	5 1	√			
letaphor/Simile/Analogy       Reciprocal Teaching       Mnemonics         eer/Self Assessment       ✓       Drawing or illustrating       Other:         /riting/Reflecting/Journals       ✓       Simulations/Role Play       Other:         /ype(s) of Grouping Used:       ✓       Simulations/Role Play       Other:         /ype(s) of Grouping Used:       ✓					
Childrig of Hobstanting       Childrig         Verifing/Reflecting/Journals       ✓         Simulations/Role Play       Other:         Verifing/Reflecting/Journals       ✓         Simulations/Role Play       Other:         Verifing/Reflecting/Journals       ✓         Simulations/Role Play       Other:         Verifies       ✓         Simulations/Role Play       Other:         Verifies       ✓         Simulations/Role Play       ✓         Transitions should be used every 5-15 minutes to keep the students' brains engaged.         Involve students in an analysis of their explorations.         Use reflective activities to clarify and modify student understanding.         Give students time to think, plan, investigate and organize collected information.         Give students the opportunity to expand and solidify their understanding of the concept and/ or apply it to a real-world situation.         Verify to a real-world					
<pre>ype(s) of Grouping Used: &lt;_small groupstudent pairswhole groupindividual xplain, Explore, Elaborate ontent Chunks: How will you divide and teach the content? • Transitions should be used every 5-15 minutes to keep the students' brains engaged. • Involve students in an analysis of their explorations. • Use reflective activities to clarify and modify student understanding. • Give students time to think, plan, investigate and organize collected information. • Give students the opportunity to expand and solidify their understanding of the concept and/ or apply it to a real-world situation. Waluate (Feedback/ Closure) • Evaluate throughout the lesson. Are students able to answer the Essential Question(s)? • Present students with a scoring guide (such as a rubric) at the beginning to self-assess. • What assessment(s) will be used to be sure the students are successful? tudents will complete the conclusions section of the observation practice worksheet # Evaluate the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view. • What caused the lesson to go well? What challenges did you encounter? • What did you do to contribute to the lesson's effectiveness? • What learning did you take from this lesson to apply to future lessons? What would you do </pre>	eer/Self Assessment	✓	Drawing or illustrating	Other:	
<ul> <li>small group</li></ul>	/riting/Reflecting/Journals	~	Simulations/Role Play	Other:	
<ul> <li>Sontent Chunks: How will you divide and teach the content?</li> <li>Transitions should be used every 5-15 minutes to keep the students' brains engaged.</li> <li>Involve students in an analysis of their explorations.</li> <li>Use reflective activities to clarify and modify student understanding.</li> <li>Give students time to think, plan, investigate and organize collected information.</li> <li>Give students the opportunity to expand and solidify their understanding of the concept and/ or apply it to a real-world situation.</li> </ul> See next page for instructional detail. Evaluate throughout the lesson. Are students able to answer the Essential Question(s)? <ul> <li>Present students with a scoring guide (such as a rubric) at the beginning to self-assess.</li> <li>What assessment(s) will be used to be sure the students are successful?</li> </ul> Students will complete the conclusions section of the observation practice worksheet understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view. <ul> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson to apply to future lessons? What would you do</li> </ul>	✓_small group _✓_stu	dent pa	irs _⊻_whole group	_⊻_individual	
<ul> <li>Evaluate (Feedback/ Closure) <ul> <li>Evaluate throughout the lesson. Are students able to answer the Essential Question(s)?</li> <li>Present students with a scoring guide (such as a rubric) at the beginning to self-assess.</li> <li>What assessment(s) will be used to be sure the students are successful?</li> </ul> </li> <li>Students will complete the conclusions section of the observation practice worksheet.</li> <li>Describe, Analyze, Reflect: <ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson to apply to future lessons? What would you do</li> </ul> </li> </ul>	<ul> <li>Transitions should be</li> <li>Involve students in al</li> <li>Use reflective activitie</li> <li>Give students time to</li> <li>Give students the opp</li> </ul>	used eve n analysi es to clar think, pl portunity	ery 5-15 minutes to keep s of their explorations. ify and modify student u an, investigate and organ to expand and solidify th	the students' brains engaged. nderstanding. nize collected information.	or
<ul> <li>Evaluate throughout the lesson. Are students able to answer the Essential Question(s)?</li> <li>Present students with a scoring guide (such as a rubric) at the beginning to self-assess.</li> <li>What assessment(s) will be used to be sure the students are successful?</li> </ul> Students will complete the conclusions section of the observation practice worksheet Describe, Analyze, Reflect: <ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What learning did you take from this lesson to apply to future lessons? What would you do</li> </ul>	See next page for instru	ictional	detail.		
<ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson's effectiveness?</li> <li>What learning did you take from this lesson to apply to future lessons? What would you do</li> </ul>	<ul> <li>Evaluate throughout t</li> <li>Present students with</li> <li>What assessment(s)</li> </ul>	the lesso n a scorin will be us	g guide (such as a rubric sed to be sure the studen	) at the beginning to self-assess. ts are successful?	eet
	<ul> <li>How effective was the understanding? Cite</li> </ul>	e lesson? evidence on to go	of student work, perforn well? What challenges d	nance, behaviors, and/ or remarks to d you encounter? ess?	

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Date:	Time Frame: 40 minutes
	Observations Practice
Essential Question:	There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. However, if time or funding were to limit your ability to make observations, which 2 observation techniques would you rely on? (decision making)
Objective (s) Numbers:	1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08
Outcomes:	Identify and create questions and hypotheses that can be answered through scientific investigations. *Develop appropriate experimental procedures for: • Given questions. • Student generated questions. *Analyze evidence to explain observations, make inferences and predictions. *Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. *Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.
Materials: Anticipatory Set:	index cards, worksheet (one per student) Today we will examine the process of observations and making observations.
	During the Lesson
Presentation of Information: Integration of Other Subjects: Integration of Reading:	Reading (prereading skills, vocabulary, dramatic presentation) Reading for information and interpretation.
Integration of Technology:	Computer, Projector, PowerPoint, Internet
Modeling:	Review the Science Method of Inquiry. Discuss observations, physical properties and the importance of making specific and detailed observations.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Presentation:	http://www.science6.org/pdf/classroom/observation_practice.pdf
Guided Practice:	Model Observations by making observations about the teacher. Collect 15 unique physical/behavioral characteristics then decide on the 5 most unique descriptors.
	After the Lesson
Independent Practice	Students will observe and record notes about another student throughout the day. On the following day they will limit their list to 5 characteristics and record them on an index card. Students will see if their observations enable a third party to identify their subject.
	<b>Advanced Learners</b> should test third party identification on 10 third parties, then create a bar graph to display the results.
Closure / Assessment:	Students will complete the conclusions section of the observation practice worksheet.

Integration with School-wide Focus: Improve Reading and Writing performance

#### **Observations Practice**

#### • Day 1

- You will be assigned a random subject (classmate).
- $\circ$   $\;$  Observe and record notes about that subject throughout the day.
  - (no bad or demeaning notes allowed if you observe them picking their nose please omit that observation)
  - No one should be able to find out who you are observing be subtle!
  - Record specific observations that you think will provide good clues to the person's identity.

#### • Day 2

- You will be given an index card.
  - Put your name (not the subject's) on the card.
  - Record your top 5 observations on this card.
- The cards will be collected and randomly redistributed.
  - Use the information on the new card to infer the identity of the subject.
  - Return the card to the scientist to verify your inference.
  - Complete the Conclusions Section below.

#### Conclusions

- $\circ$   $\;$  Respond to the following in complete sentences that restate and answer the question.
  - Was your subject correctly identified?
  - Was it easy or hard to observe your subject without their knowledge? (Give an example)
  - Compare your original list with the 5 final observations and answer either 1 or 2 below.
    - 1. Was there an observation you wished you had included?
    - 2. Which observation do you think was the most informative?
  - Make a double list table to respond to: "Besides scientists and teachers, what occupations might need to make careful observations to fulfill their duties? (at least 3)"

Occupation	Observations
Scientists	Physical properties, Reactions
Teachers	Learning Styles, Conduct, Current Effort

# 1.01, 2.02

Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.

Archeology is studying past civiliztions and cultures, while space exploration is development of technologies for future human advancements. If you had \$10,000 to give to one of these sciences, which one would you choose? Explain. (decision making)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan How Science Works

NAME:				Su	bject:	Science	9		
Date:				Gra	ade Le	vel(s):	: 6		
Standards/ Objectiv	es Add	Iress	ed (NCSCOS)						
1.01, 2.02									
Use information sys								s th	at
are subject to techn	ologica	al sol	ution. Locate	res	sources	s to obt	tain and test ideas.		
Essential Question(									
Archeology is studyi	• •						• •		
development of tech	•						•	00	to
give to one of these	scienc	ces, v	vhich one wo	uld	you ch	loose?	Explain. (decision		
making)									
Assess (Look at studer	nt data t	o plan	. Use formative	and	/ or sum	mative a	ssessments.)		
Examine student rea	adines	s and	l mastery gra	ıde	level r	eading	and evaluation. St	ude	nts
will need assistance	and m	odel	ing to maste	r th	e resta	te and	answer format to		
complete evaluation	ı assigr	nmer	its.						
High Yield Instructi	onal Si	trate	gies (check a	all t	hat ap	ply to t	he lesson)		
Identifying similarities			ig effort and	✓	Nonling		Setting objectives	✓	
and differences	pro	viding	recognition		represe	ntation	and providing feedback		
Questions, cues, and	✓ Sur	mmariz	zing and note	✓	Coopera	ative	Generating and	~	1
advance organizers	tak		-		learning		testing hypotheses		_
Homework and practice	~								
504 modifications E on remediation and Engage (Anticipator Capture the stud Consider novelty Today we will exam contrast science and	enrich r <b>y Set)</b> lents' at , meanin ine pur	ment tentio ng and re sci	n, stimulate the demotion.	d hi ir th	gher al inking a d scien	nd help t	roups. them access prior knowl		
Instructional Practi	ces Us	ed in	this Lesson						
Coaching		~	Providing Directions	ction	is/ 🗸	Learnin	g Centers		
Discussion		~	Providing opportunities f practice	or	~	Teache Answer	r-directed Questions and s		<ul><li>✓</li><li>✓</li></ul>
Hands-on experiences		~	Direct Instruct	ion	✓	Modelin			~
Presentation		~	Testing		~	Other:	Science6.org		✓

Suggested brained-based learning	act	ivities promoting the ab	ove	Instructional Practices	
Think-Pair-Share	✓	Instructional Games		Music/Rhyme/Rhythm/Rap	
Thinking Maps		Student Facilitators		Movement	
Technology Integration	✓	Storytelling		Humor	
Use of visuals	✓	Field Trips(Virtual)		Project/Problem- Based Learning	✓
Metaphor/Simile/Analogy		Reciprocal Teaching		Mnemonics	
Peer/Self Assessment	~	Drawing or illustrating		Other:	
Writing/Reflecting/Journals	~	Simulations/Role Play		Other:	
<b>Type(s) of Grouping Used:</b> _⊻_small group _⊻_student	t pa	.irs _⊻_whole group	D	_⊻_individual	
<ul> <li>Involve students in an ana</li> <li>Use reflective activities to</li> <li>Give students time to thin</li> </ul>	dev Iysi clai k,p nity	ery 5-15 minutes to kee s of their explorations. rify and modify student u an, investigate and orga to expand and solidify t	p the unde unize	e students' brains engaged. erstanding.	
See next page for instructio	nal	detail.			
	esso corir	ng guide (such as a rubri	c) a	wer the Essential Question(s)? t the beginning to self-assess. are successful?	
• •	).	Then present their o	dig	and, and 3 artifacts (choose to another advanced learner, ite map.	
understanding? Cite evide support your view. • What caused the lesson to	ence go	of student work, perfor well? What challenges	mar did y		
<ul> <li>What did you do to contrib</li> <li>What learning did you take differently next time?</li> </ul>				s? ture lessons? What would you do	

Date:	Time Frame: 80 minutes
	How Science Works
Essential Question:	Archeology is studying past civilizations and cultures, while space exploration is development of technologies for future human advancements. If you had \$10,000 to give to one of these sciences, which one would you choose? Explain. (decision making)
Objective (s) Numbers:	1.01, 2.02
Outcomes:	Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.
Materials: Anticipatory Set:	Textbook pages 6-11, Presentation CD Today we will examine pure science and applied science. We will compare and contrast science and technology through an examination of archeological finds.
	During the Lesson
Presentation of Information: Integration of Other Subjects:	Writing (Restating questions in declarative format) Reading (prereading skills, vocabulary, dramatic presentation)
Integration of Reading: Integration of Technology:	Reading for information and interpretation. Computer, Projector, PowerPoint, Internet
Modeling:	Review and define the lesson vocabulary: science, technology, archeology
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Guided Practice:	Popcorn styled reading of the Science Passage with occasional breaks for further discussion and illustration.
	After the Lesson
Independent Practice	Students will respond to the review questions on page 11 using the restate and explain method of response.
	<b>Advanced Learners</b> should create an archeological dig using an aluminum pan, sand, and 3 artifacts (choose various math manipulatives). Then present their dig to another advanced learner, who will carefully excavate the site while creating a site map.
Closure / Assessment:	Selected students will share and discuss their responses to selected questions.
Reflection:	

Integration with School-wide Focus: Improve Reading and Writing performance

# 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08

Identify and create questions and hypotheses that can be answered through scientific investigations. \*Develop appropriate experimental procedures for: • Given questions. • Student generated questions. \*Analyze evidence to explain observations, make inferences and predictions. \*Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. \*Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.

There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan Can You Find The Peanut?

Standards/ Objectives Addressed (NCSCOS)         1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08         Identify and create questions and hypotheses that can be answered through scientific investigations. * Develop appropriate experimental procedures for: - Given questions. * Student generated questions. * Objective simulations to - Test hypotheses. + Evaluate how data fit. * Use oral and written language to: - Communicate findings. • Defend conclusions of y ways to gather observations that will help you form a hypothesis and obviously the more observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)         Assess (Look at student data to plan. Use formative and/ or summative assessments.)         Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities ' Reinformative and/ or summative assessments.)         Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities ' Reinformad' Example and the providing recognition ' Learning Chererating and testing hypotheses is and providing recognition ' Learning Chererating and testing hypotheses.         Ouestions, cues, and distementiate to meet the needs of all learners i	NAME:				Subject: Science				
1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08         Identify and create questions and hypotheses that can be answered through scientific investigations. * Develop appropriate specific rest of a questions * Student generated questions. * Analyze evidence to experimental protectives for * end questions. * Student generated questions. * Analyze evidence to experimental protectives for * end questions. * Student generated questions. * Analyze evidence to experimental protectives of and writer language to: * Communicate findings. * Defend computer simulations for * Test behaves and over the language to: * Communicate findings. * Defend computers and variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)         Assess (Look at student data to plan. Use formative and/ or summative assessments.)         Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities in a summarizing and note increases       Setting objectives and providing recognition in feature in and proved process?         Questions, cues, and differentiate to meet the needs of all learners in your class?       Setting hypotheses         Identifying similarities in a providing recognition in representation and presentations will focus on remediation and enrichment of lower and higher ability groups.         Engage (Anticipatory Set)	Date:				Grade Level (s): 6				
Identify and create questions and hypotheses that can be answered through scientific investigations. * Develop explain observations, make inferences and predictions. * Student four duestions. * Analyze evidence to explain observations, make inferences and predictions. * Prepare models and/or computer simulations to: * Test hypotheses. * Studuate how data fit. * Use oral and written language to: * Communicate findings. * Defend conclusions of scientific investigations.         Essential Question(s) (In student-friendly terms)       There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)         Assess (Lock at student data to plan. Use formative and/or summative assessments.)         Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities ×       Peinforcing effort and ×       Nonlinguistic representation and providing recognition is taking and note is taking and note is taking and note is taking hypotheses is taking and practice         Learner Diversity       •       Nonlinguistic ganizers       Setting objectives on remediations and enrichment of lower and higher ability groups.         504 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.         Today									
There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)         Assess (Look at student data to plan. Use formative and/ or summative assessments.)         Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities of Reinforcing effort and and differences       Nonlinguistic source and review of generating and recegnition is representation is and providing recognition is representation.         Questions, cues, and dynamic recognition       Cooperative of Generating and ote issue of the sting hypotheses.         Elearner Diversity       •         •       How will you differentiate to meet the needs of all learners in your class?         504 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.         Engage (Anticipatory Set)       •         •       Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider noveity, meaning and emotion.         Today we will examine the process of observations and making observations.         Instructional Practices Used in this Lesson         Coaching </td <td colspan="8">1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08 Identify and create questions and hypotheses that can be answered through scientific investigations. * Develop appropriate experimental procedures for: • Given questions. • Student generated questions. * Analyze evidence to explain observations, make inferences and predictions. * Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. * Use oral and written language to: • Communicate findings. • Defend</td>	1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08 Identify and create questions and hypotheses that can be answered through scientific investigations. * Develop appropriate experimental procedures for: • Given questions. • Student generated questions. * Analyze evidence to explain observations, make inferences and predictions. * Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. * Use oral and written language to: • Communicate findings. • Defend								
hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)         Assess (Look at student data to plan. Use formative and/ or summative assessments.)         Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities and providing recognition recognition in providing recognition is the advance organizers taking taking and note differences is taking blectives and providing recognition is testing hypotheses is the work and practice taking taking and note testing hypotheses         Eventer Diversity       •         S04 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.         Engage (Anticipatory Set)       •         •       Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.         Today we will examine the process of observations and making observations.       •         Instructional Practices Used in this Lesson       •         Coaching       •       Providing Directions/ *         Discussion       •       Providing Directions/ * <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>									
Examine student readiness and mastery of the Scientific Method and process. Read and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities and differences       Reinforcing effort and providing recognition       Nonlinguistic representation       Setting objectives and reduced providing recognition         Ouestions, cues, and advance organizers       Summarizing and note taking       Cooperative cooperative of Generating and testing hypotheses         Homework and practice       Image: Cooperative of Generating and testing hypotheses       Image: Cooperative of Generating and testing hypotheses         • How will you differentiate to meet the needs of all learners in your class?       So4 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.         Engage (Anticipatory Set)       • Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.         Today we will examine the process of observations and making observations.       Imstructional Practices Used in this Lesson         Coaching       Y Providing Directions/ Y Learning Centers       Teacher-directed Questions and Answers         Discussion       Y Providing tractions of providing and providing tractions of providing tractice       Y Teacher-directed Questions and Answers	There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)								
and review a few "conclusions" from the last lab.         High Yield Instructional Strategies (check all that apply to the lesson)         Identifying similarities and differences	ASSESS (LOOK at student data			anu	or sum	mative	13363	Samenta.)	
Identifying similarities and differences <ul> <li>Reinforcing effort and providing recognition</li> <li>Providing recognition</li> <li>Cooperative representation</li> <li>Reinforcing and note taking</li> <li>Cooperative representation</li> <li>Cooperative representation</li> <li>Reinforcing and note taking</li> <li>Reinforcing and note taking</li> <li>Reading and practice</li> </ul> Learner Diversity <ul> <li>How will you differentiate to meet the needs of all learners in your class?</li> </ul> 504 modifications ET and RA.         Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.           Engage (Anticipatory Set) <ul> <li>Coapture the students' attention, stimulate their thinking and help them acce</li></ul>			•			ific Me	thoo	d and process. Read	
and differences       providing recognition       representation       and providing reduck         Questions, cues, and advance organizers       Summarizing and note taking       Cooperative learning       Cooperative generating and testing hypotheses         Homework and practice       Image: State and testing hypotheses       Cooperative generating and testing hypotheses       Image: State and testing hypotheses         Learner Diversity       •       How will you differentiate to meet the needs of all learners in your class?         504 modifications ET and RA.       Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.         Engage (Anticipatory Set)       •       Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.         Today we will examine the process of observations and making observations.       Instructional Practices Used in this Lesson         Coaching       Y       Providing Directions/ Y       Learning Centers instructed Questions and Answers         Discussion       Y       Providing opportunities for protected Questions and Answers       Y	High Yield Instructional	Strateg	gies (check a	ll tl	nat ap	ply to t	he	lesson)	
Homework and practice       Image: Construction of the second of the secon	and differencespQuestions, cues, and✓	roviding Summariz	recognition		represe Coopera	ntation ative	~	and providing feedback Generating and	-
Learner Diversity       • How will you differentiate to meet the needs of all learners in your class?         504 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.         Engage (Anticipatory Set)         • Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.         Today we will examine the process of observations and making observations.         Instructional Practices Used in this Lesson         Coaching <ul> <li>Providing Directions/</li> <li>Learning Centers Instructions</li> <li>Teacher-directed Questions and Answers</li> </ul>		aking			learning	]		testing hypotheses	
on remediation and enrichment of lower and higher ability groups.  Engage (Anticipatory Set) Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.  Today we will examine the process of observations and making observations.  Instructional Practices Used in this Lesson  Coaching  Y Providing Directions/ Discussion  Y Providing Providing Y Teacher-directed Questions and Answers Y									
Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.  Today we will examine the process of observations and making observations.  Instructional Practices Used in this Lesson  Coaching  Y Providing Directions/ Discussion  Y Providing Opportunities for practice  Y	504 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.								
Instructional Practices Used in this Lesson         Coaching       ✓       Providing Directions/ Instructions       ✓       Learning Centers         Discussion       ✓       Providing opportunities for practice       ✓       Teacher-directed Questions and Answers       ✓	Capture the students' a	attention		ir thi	nking a	nd help	them	n access prior knowledge	•
Coaching       ✓       Providing Directions/ Instructions       ✓       Learning Centers         Discussion       ✓       Providing opportunities for practice       ✓       Teacher-directed Questions and Answers       ✓	Today we will examine the process of observations and making observations.								
Instructions     Instructions       Discussion     ✓       Providing opportunities for practice     ✓	Instructional Practices Used in this Lesson								
Discussion v Providing opportunities for practice v v v v v v v v v v v v v v v v v v v	Coaching			tion	s/ 🗸	Learnin	ng Ce	enters	
Hands-on experiences 🗸 Direct Instruction 🗸 Modeling 🗸	Discussion	✓	Providing opportunities for	or	✓		-	ected Questions and	✓ ✓
				on					✓ ✓
Presentation     ✓     Testing     ✓     Other:     Science6.org	Presentation	v	resting		v	Other:	Scie	nceo.org	$\checkmark$

Suggested brained-based learn Think-Pair-Share	ing act √	ivities promoting the abo Instructional Games	Music/Rhyme/Rhythm/Rap	
		Student Facilitators	Mosic/ highle/ highlin/ hap	✓
Thinking Maps	✓			•
Technology Integration Use of visuals	✓ ✓	Storytelling Field Trips(Virtual)	Humor Project/Problem- Based Learning	
Metaphor/Simile/Analogy		Reciprocal Teaching	Mnemonics	
Peer/Self Assessment	✓	Drawing or illustrating	Other:	
	· ·	Simulations/Role Play	Other:	
Writing/Reflecting/Journals		Simulations/ Role Play	Other.	
Type(s) of Grouping Used _✓_small group _✓_stud		irswhole group	_ <b>∠_</b> individual	
<ul> <li>Involve students in an</li> <li>Use reflective activities</li> <li>Give students time to t</li> </ul>	ised ev analysi s to clar hink, pl rtunity	ery 5-15 minutes to keep s of their explorations. ify and modify student u an, investigate and orga to expand and solidify th	the students' brains engaged.	or
See next page for instruc		detail.		
<ul> <li>Present students with a</li> </ul>	e lesso a scorir		answer the Essential Question(s)? c) at the beginning to self-assess. its are successful?	
Students should share an between 2 objects with v			it "How could you tell the differ properties?"	ence
understanding? Cite ex support your view. • What caused the lessor • What did you do to con	lesson? vidence n to go tribute	of student work, perform well? What challenges d to the lesson's effective		

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Date:	Time Frame: 80 minutes
Subject: Science Grade 6	Date:
	Can You Find The Peanut?
Essential Question:	There are a variety of ways to gather observations that will help you form a hypothesis and obviously the more observations you can make the more likely it is that you will form a sound hypothesis. Create an organized process for gathering information that will enable an observer to carefully collect as many observations as possible. (action plan)
Objective (s) Numbers:	1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08
Outcomes:	Identify and create questions and hypotheses that can be answered through scientific investigations. *Develop appropriate experimental procedures for: • Given questions. • Student generated questions. *Analyze evidence to explain observations, make inferences and predictions. *Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. *Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.
Materials: Anticipatory Set:	peanuts (one per pair), balance, small paper clips Today we will examine the process of observations and making observations.
	During the Lesson
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Restating questions in declarative format) Reading (prereading skills, vocabulary, dramatic presentation) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet
Modeling:	Review the Science Method of Inquiry. Discuss physical properties and observations. Today we will focus on the observation / inference step of the Science Method. Safety Warning! This activity involves peanuts. Peanut allergies are serious and dangerous. If you know of your allergy and have not reported it to the school - please report that allergy now.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Presentation:	http://www.science6.org/pdf/classroom/peanut.pdf
Guided Practice:	Assist the students through each phase of the Science Method. Pay special attention to questions, observations / inferences.
	After the Lesson
Independent Practice	Students will create an abstract to outline the Science Method as it applies to the strategies they used to find their peanut.
	<b>Advanced Learners</b> should test third party identification on 10 third parties, then create a bar graph to display the results.
Closure / Assessment:	Students should share and discuss their ideas about "How could you tell the difference between 2 objects with virtually identical physical properties?"
Reflection:	

Integration with School-wide Focus: Improve Reading and Writing performance

#### Can You Find The Peanut?

- Materials:
  - o bag of peanuts (apples if peanut allergy present)
  - o balance and small paper clips for weights
- Introduction:
  - Safety Warning! This activity involves peanuts. Peanut allergies are serious and dangerous.
  - $\circ$  Review the Science Method.
    - The nature of today's activity will allow us to combine the Data and Analyze Data Steps.
  - $\circ$   $\;$  Discuss the Observation Step of the Science Method of Inquiry.
    - Emphasize the importance of making observations and inferences.
- Lesson:
  - Give each pair of students a peanut and encourage them to record as many observations about the physical properties of their peanuts as possible. Encourage them to use the balance, draw pictures, count dents.
    - Any pair that alters their peanut in any way will immediately report to the "standard science" group and stop participating in this activity.
  - **Question**: Can objects be identified by carefully observing its physical properties?
  - **Observations / Inferences:** Students will record detailed observations about the peanut.
  - **Hypothesis**: Students restate and answer the question in an affirmative or negative response.
  - Procedures:
    - Peanuts are placed into a pile.
    - Students attempt to identify their peanut using its physical properties.
      - Arguing groups need to keep it civilized!
  - Analyze Data: Students record the properties that helped them to most easily identify their peanuts.
  - Conclusions:
    - Students state whether their hypothesis was proved or not proved.
    - Students discuss any problems that may have arisen.
    - Students write a sentence to discuss another experiment that this process leads them to want to try.
- Applications:
  - How could you tell the difference between 2 objects with virtually identical physical properties?

# 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08

Identify and create questions and hypotheses that can be answered through scientific investigations. \*Develop appropriate experimental procedures for: • Given questions. • Student generated questions. \*Analyze evidence to explain observations, make inferences and predictions. \*Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. \*Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.

Observations are used to make inferences. If you were limited to two types of observations, which 2 would you choose? Support your choice.

(decision making)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan Making Inferences

NAME:	Subject: Science							
Date:		ade Lev	vel (s)	: 6				
Standards/ Objectiv			)					
1.01, 1.02, 1.04, 1.0 Identify and create question appropriate experimental pi explain observations, make hypotheses. • Evaluate how conclusions of scientific inver- Essential Question(	ns and hypoth rocedures for inferences ar data fit. * U estigations.	eses that can be a • Given questions nd predictions. * Pr se oral and written	. • St epare langu	udent ge models	nerated o and/or co	quest ompu	ions. * Analyze evidence iter simulations to: • Test	
	<u></u>							
Observations are us observations, which			-				••	
Assess (Look at studer	nt data to pla	an. Use formative	and	or sum	mative a	asses	ssments.)	
Examine student rea and review a few "co		•			ific Me	tho	d and process. Re	ad
High Yield Instruction	onal Strat	egies (check	all t	hat app	oly to t	the	lesson)	
Identifying similarities and differences		ing effort and g recognition	~	Nonling: represer			Setting objectives and providing feedback	~
Questions, cues, and advance organizers Homework and practice	✓ Summa taking	Summarizing and note taking			tive	✓ 	Generating and testing hypotheses	✓
• How will you diff 504 modifications E on remediation and	T and RA.	Differentiate	d as	signme	ents ar	nd p	resentations will f	ocus
Engage (Anticipator • Capture the stud Consider novelty	ents' attenti		eir th	inking aı	nd help	then	n access prior knowled	ge.
One of the most imp ability to infer ideas observations and inf	from data ferences.	a. Today we v			•			
	ces Used i	n this Lesson						
Instructional Practic			ction	s/ ✓	Learnir	ng Ce	enters	
Instructional Practic	<b>`</b>	Providing Dire						
	✓ ✓	Instructions	for	~	Teache Answe	-	ected Questions and	~
Coaching	×	Instructions Providing opportunities		×	Answe Modeli	rs ng	rected Questions and	

Sugges	sted brained-based learning	act	ivities promoting the ab	ove	Instructional Practices					
Think-P	air-Share	✓	Instructional Games		Music/Rhyme/Rhythm/Rap					
Thinking	g Maps		Student Facilitators		Movement					
Technol	ogy Integration	✓	Storytelling		Humor					
Use of v		√	Field Trips(Virtual)		Project/Problem - Based Learning	✓				
	or/Simile/Analogy		Reciprocal Teaching		Mnemonics					
	If Assessment	✓	Drawing or illustrating	~	Other:					
Writing/	Reflecting/Journals	~	Simulations/Role Play		Other:					
	<b>Type(s) of Grouping Used:</b> _✓_small group _✓_student pairs _✓_whole group _✓_individual									
<ul> <li>Explain, Explore, Elaborate</li> <li>Content Chunks: How will you divide and teach the content?</li> <li>Transitions should be used every 5-15 minutes to keep the students' brains engaged.</li> <li>Involve students in an analysis of their explorations.</li> <li>Use reflective activities to clarify and modify student understanding.</li> <li>Give students time to think, plan, investigate and organize collected information.</li> <li>Give students the opportunity to expand and solidify their understanding of the concept and/ or apply it to a real-world situation.</li> </ul>										
See n	ext page for instructio	nal	detail.							
<ul> <li>Evaluate (Feedback/ Closure)</li> <li>Evaluate throughout the lesson. Are students able to answer the Essential Question(s)?</li> <li>Present students with a scoring guide (such as a rubric) at the beginning to self-assess.</li> <li>What assessment(s) will be used to be sure the students are successful?</li> </ul>										
Students will share their advertisements and the inferences they based the design on.										
<ul> <li>Describe, Analyze, Reflect:         <ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson's effectiveness?</li> </ul> </li> </ul>										
<ul> <li>What learning did you take from this lesson to apply to future lessons? What would you do differently next time?</li> </ul>										

Date:	Time Frame: 80 minutes
	Making Inferences
Essential Question:	Observations are used to make inferences. If you were limited to two types of observations, which 2 would you choose? Support your choice. (decision making)
Objective (s) Numbers:	1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08
Outcomes:	Identify and create questions and hypotheses that can be answered through scientific investigations. *Develop appropriate experimental procedures for: • Given questions. • Student generated questions. *Analyze evidence to explain observations, make inferences and predictions. *Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. *Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.
Materials:	Magazines, scissors, glue sticks, poster paper, colored pencils, markers or crayons
	<b>Preparation</b> : Tell the students that they will need a magazine or two (2 or 3 days in advance of the lesson)
Anticipatory Set:	One of the most important aspects of the science method (or any subject) is your ability to infer ideas from data. Today we will use advertisements to make observations and inferences.
	During the Lesson
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Restating questions in declarative format) Reading (prereading skills, vocabulary, dramatic presentation) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet
Modeling:	Review the Science Method of Inquiry. Discuss advertising purposes, procedures and affects. Explain inferences and practice making inferences from basic observations.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Presentation:	http://www.science6.org/pdf/classroom/inferences.pdf
Guided Practice:	Model the 3 steps of today's Lab: Observations, Inferences and Reporting, using a projected ad. Discuss the self created ad; purpose, content and desired outcome.
	After the Lesson
Independent Practice	Students (in small groups) will complete the lab (3 observations and inferences for 3 ads). Groups will create an advertisement for an imaginary or mundane product.
	Advanced Learners may want to create a 20 second radio commercial for their product.
Closure / Assessment:	Students will share their advertisements and the inferences they based the design on.

Integration with School-wide Focus: Improve Reading and Writing performance

#### **Inferences in Advertising**

- Materials:
  - Magazine Advertisements (three or four)
    - if you can get them from different magazines that is best
  - o scissors, glue sticks, poster paper, colored pencils, markers or crayons
- Directions:
  - $\circ$   $\;$  Read and follow the instructions for each step of the Activity.
  - $\circ$  Respond to questions with complete sentences that restate the question.
  - Attach your written work to this paper.
- Activity:
  - Observations:
    - What do you think is the purpose of the many advertisements that you see and hear?
    - What do you think the advertisers of products want you to infer from their ads?
  - Procedures:
    - Procedure / Experiment:
      - Examine 3 advertisements.
      - Record the most reasonable inference about the product being advertised.
      - Determine if you made the inference that the advertiser hoped you would.
        - (get a parent or friend to evaluate your data)
  - o Data:
    - Copy and fill out the table.
    - Examine each of the advertisements and draw the most reasonable conclusions.

### What do the advertisers want you to infer?

Add	Observations	Inferences

- Analysis:
  - Respond to each of the following in complete sentences that restates and answers the question.
    - Choose the most interesting ad and tell what emotion the advertiser tried to convey.
      - Did the advertiser successfully communicate their message?
- New Experiment:
  - You (and your group) will play advertising executive.
    - Select a product (or invent one)
    - Infer what population group should be targeted for advertising.
      - Who will buy your product?
      - Will they have enough money and power to make you rich?
    - Create an advertisement that will appeal to the target population.
    - Present your advertisement and see if your classmates can recognize your target population.

# 1.01, 2.02

Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.

Due to limited funding, a team of scientists must choose one of the following 2 scenarios. Which scenario would you vote to attempt and why? (decision making) 1. Run a complete trial set (with repetition) for the vaccine against athlete's foot (including a proper control group and specifically isolated independent variable) or 2. Run a single trial of a cure for cancer on a small group of 5 cancer patients. (decision making)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan How Science Works

						Subject: Science Grade Level (s): 6				
Standards/ Objectives Add	dress	ed (NCSCOS)								
1.01, 2.02										
Use information systems t	o: Id	entify scienti	fic r	needs,	, human r	needs, or problems t	hat			
are subject to technologica	al sol	ution. Locate	res	source	s to obtai	in and test ideas.				
Essential Question(s) (In s	studen	t-friendly terms	;)							
Due to limited funding, a t	eam	of scientists	mu	st cho	ose one c	of the following 2				
scenarios. Which scenario	o wou	ld you vote t	o at	ttemp	t and why	<pre>(decision making)</pre>	1.			
Run a complete trial set (v	with r	epetition) for	r th	e vaco	cine again	st athlete's foot				
(including a proper control	l grou	up and specif	ical	ly isol	ated inde	pendent variable) or	2.			
Run a single trial of a cure	e for o	ancer on a s	ma	ll grou	ip of 5 cai	ncer patients.				
Assess (Look at student data t	o plan	. Use formative	and	/ or sun	nmative ass	essments.)				
Examine student readines:	s and	mastery gra	ade	level	reading a	nd evaluation. Stude	ente			
will need assistance and m	nodel	ing to master	r th	e rest	ate and a	nswer format to				
complete evaluation assign	nmen	its.								
High Yield Instructional S	trate	gies (check a	all t	hat ap	ply to the	e lesson)				
Identifying similarities 🖌 Rei	inforcin	g effort and	✓	Nonling		Setting objectives	/			
, .		recognition			entation	and providing				
						feedback				
	mmariz king	ing and note	~	Cooper learnin		Generating and testing hypotheses				
Homework and practice $\checkmark$	ling			learnin	9					
• How will you differentiat 504 modifications ET and on remediation and enrich	RA.	Differentiated	d as	signm	ents and	presentations will fo	cus			
Engage (Anticipatory Set) • Capture the students' at Consider novelty, meani	tentio		ir th	inking	and help the	em access prior knowledg	je.			
Today we will read about t learn some new principles the value of a constant.		•		•						
Instructional Practices Us	ed in				1					
Coaching	~	Providing Direct Instructions	ction	is/ ✓	Learning	Centers				
Discussion	~	Providing opportunities f practice	or	~	Teacher-o Answers	lirected Questions and	*			
Hands-on experiences		Direct Instruct	ion	√	Modeling		•			
Presentation	$\checkmark$	Testing		✓	Other: So	cience6.org	~			

Suggested bysined based leave		ivition numering the ch	and Instructional Drastics	
Suggested brained-based learn Think-Pair-Share	ing aci	Instructional Games	Music/Rhyme/Rhythm/Rap	
Thinking Maps	_	Student Facilitators	Movement	
Technology Integration	√	Storytelling	Humor	
Use of visuals	~	Field Trips(Virtual)	Project/Problem - Based Learning	✓
Metaphor/Simile/Analogy		Reciprocal Teaching	Mnemonics	
Peer/Self Assessment	✓	Drawing or illustrating	Other:	
Writing/Reflecting/Journals	✓	Simulations/Role Play	Other:	
Type(s) of Grouping Used _✓_small group _✓_stud		uirs _⊻_whole group	o _∕_individual	
<ul> <li>Involve students in an</li> <li>Use reflective activities</li> <li>Give students time to the students tim</li></ul>	sed ev analys to cla nink, p rtunity situati	ery 5-15 minutes to keep is of their explorations. rify and modify student u lan, investigate and orga to expand and solidify tl on.	the students' brains engaged.	or
Evaluate (Feedback/ Clos				
<ul> <li>Evaluate throughout th</li> <li>Present students with a</li> </ul>	e lesso I scorii		answer the Essential Question(s)? c) at the beginning to self-assess. nts are successful?	
Learners will share the re feel was the most likely t	•	-	ntal Procedures Activity" that th	ey
understanding? Cite ev support your view. • What caused the lessor • What did you do to con	esson' 'idence to go tribute	e of student work, perform well? What challenges d to the lesson's effective		

Date:	Time Frame: 80 minutes
	Scientific Problem Solving
Essential Question:	Due to limited funding, a team of scientists must choose one of the following 2 scenarios. Which scenario would you vote to attempt and why? (decision making) 1. Run a complete trial set (with repetition) for the vaccine against athlete's foot (including a proper control group and specifically isolated independent variable) <b>or</b> 2. Run a single trial of a cure for cancer on a small group of 5 cancer patients.
Objective (s) Numbers:	1.01, 2.02
Outcomes:	Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.
Materials:	Textbook pages 12-18, Presentation CD
Anticipatory Set:	Today we will read about the application of the steps of the Scientific Method. You will learn some new principles including independent and dependent variables as well as the value of a constant.
	During the Lesson
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Restating questions in declarative format) Reading (prereading skills, vocabulary, dramatic presentation) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet
Modeling:	Review and define the lesson vocabulary: independent and dependent variables and the constant. Use author's craft as a prereading strategy.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Guided Practice:	Popcorn styled reading of the Science Passage with occasional breaks for further discussion and illustration.
	After the Lesson
Independent Practice	Students will respond to the review questions on page 18 using the restate and explain method of response.
	Advanced Learners should work in cooperative learning groups to determine an apporpriate control for various experiments. (see attachment/transparency)
Closure / Assessment:	Selected students will share their responses to selected questions. Advanced learners will share the response to the "Experimental Procedures Activity" that they feel was the most likely to be correct.
Integration with School-wide For	cus: Improve Reading and Writing performance

#### **Experimental Procedures Activity**

Choose 4 "questions" below and consider what the independent variable, dependent variable, constants and control experiment would be for the procedures portion of The Scientific Method of Inquiry.

#### Example -

"Does sugar dissolve faster in hot water or cold water?"

Independent: Water Temperature

Dependent: Elapsed Time for sugar to dissolve.

Constants: Amount of water, amount of sugar, no stirring.

Control: Time how long it takes to dissolve sugar in water that is at room temperature  $(75^{\circ})$ .

#### **Questions:**

Will a nail rust faster after being coated with an acidic liquid (high ph) or a base liquid (low ph).

Will exercise raise a person's blood pressure?

Which of the primary colors attracts and holds the most solar energy?

Will chewing wintergreen lifesavers actually make sparks in my mouth?

How many hours of studying should be done to prepare for a test?

Do chemicals like aspirin act differently when heat is present?

Which lubricant (Graphite or WD40) will enable the fastest speeds in a standard soap box derby car?

Which frequency of light will produce the best plant (lawn) growth, red, green or blue?

Which plant fertilizer (Miracle Grow or Dyna-Grow) will give the better results when applied to a fern?

Can Pepsi, Coke and RC Cola be identified in a blind taste test?

What liquid causes hands to wrinkle the fastest?

How does the size of a pumpkin compare to the number of seeds in it?

How do different types of music affect blood pressure?

Which ingredient causes the least amount of change in chocolate chip cookies?

Is the strength of a magnet affected by extreme heat and extreme cold?

What happens to raisons that are placed in a glass of 7-up?

Do fans really cool you off during the hot weather?

## **Science Objectives**

# 1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08

Identify and create questions and hypotheses that can be answered through scientific investigations. \*Develop appropriate experimental procedures for: • Given questions. • Student generated questions. \*Analyze evidence to explain observations, make inferences and predictions. \*Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. \*Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.

What steps would you need to take to set up and maintain a neighborhood compost pile? (action plan)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan Making Inferences

NAME: Subject: Science							
Date: Grade Level (s): 6							
Standards/ Objectives Addr	essed (NCSCOS)						
1.01, 1.02, 1.04, 1.05, 1.06 Identify and create questions and hyp appropriate experimental procedures explain observations, make inferences hypotheses. • Evaluate how data fit. conclusions of scientific investigations	ootheses that can be ar for: • Given questions. s and predictions. * Pre * Use oral and written	. • Studen epare mod	t gei dels a	nerated c and/or co	questi ompu	ions. * Analyze evidence t ter simulations to: • Test	0
Essential Question(s) (In stu		5)					
What steps would you need pile? (action plan)	to take to set u	p and r	naiı	ntain a	ı nei	ghborhood compos	st
Assess (Look at student data to	plan. Use formative	and/ or s	sumr	native a	isses	sments.)	
Examine student readiness and review a few "conclusio	ons" from the las	t lab.				•	ld
High Yield Instructional Str	ategies (check a	all that	app	bly to t	nel	esson)	
	forcing effort and iding recognition		lingu reser	istic Itation		Setting objectives and providing feedback	
Questions, cues, and advance organizers✓Sum takinHomework and practice	marizing and note Ig		pera ning	tive	~	Generating and testing hypotheses	
<ul> <li>Learner Diversity</li> <li>How will you differentiate</li> </ul>	to meet the needs o	of all lear	ners	s in your	r clas	s?	
504 modifications ET and R on remediation and enrichm		•			•		cus
Engage (Anticipatory Set) <ul> <li>Capture the students' atte</li> <li>Consider novelty, meaning</li> </ul>		ir thinkir	ng ar	nd help	them	access prior knowledg	e.
Today we will discuss and d Problem Solving. While our variables, we will examine o	special focus wil	ll be on	ind	lepend	lent	and dependent	
Instructional Practices Use	d in this Lesson						
Coaching	<ul> <li>✓ Providing Direc</li> <li>Instructions</li> </ul>	ctions/	~	Learnin	ng Ce	nters	
Discussion	<ul> <li>Providing opportunities f practice</li> </ul>	or	~	Teache Answei	-	ected Questions and	✓ ✓
Hands-on experiences	Direct Instruct	ion	√	Modelin			✓
Presentation	✓ Testing		✓	Other:	Scie	nce6.org	~

Sugges	sted brained-based learning	act	ivities promoting the ab	ove	Instructional Practices	
Think-P	air-Share	~	Instructional Games		Music/Rhyme/Rhythm/Rap	
Thinking	g Maps		Student Facilitators		Movement	
Technol	logy Integration	✓	Storytelling		Humor	
Use of v		$\checkmark$	Field Trips(Virtual)	-	Project/Problem- Based Learning	✓
-	or/Simile/Analogy		Reciprocal Teaching	1	Mnemonics	
	elf Assessment	✓	Drawing or illustrating	✓	Other:	
Writing/	/Reflecting/Journals	~	Simulations/Role Play		Other:	
	s) of Grouping Used: all group _⊻_studen	t pa	irs _ <b>∠_</b> whole group	D	_∕_individual	
	Involve students in an ana Use reflective activities to Give students time to thin	devo Ilysi clar k,pl nity	ery 5-15 minutes to kee s of their explorations. ify and modify student u an, investigate and orga to expand and solidify t	o the unde unize	e students' brains engaged. erstanding.	or
See n	ext page for instructio	nal	detail.			
Evalu • •		esso corin	ig guide (such as a rubri	c) a	wer the Essential Question(s)? t the beginning to self-assess. are successful?	
Select abstra		th	eir analyze data and	d cc	onclusion paragraphs of the	
<ul> <li>Describe, Analyze, Reflect:         <ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson's effectiveness?</li> </ul> </li> </ul>						
•	What learning did you take differently next time?	e fro	om this lesson to apply t	o fu	ture lessons? What would you do	

Date:	Time Frame: 80 minutes
	Scientific Problem Solving - Composting
Essential Question:	What steps would you need to take to set up and maintain a neighborhood compost pile? (action plan)
Objective (s) Numbers: Outcomes:	<b>1.01, 1.02, 1.04, 1.05, 1.06, 1.07, 1.08</b> Identify and create questions and hypotheses that can be answered through scientific investigations. *Develop appropriate experimental procedures for: • Given questions. • Student generated questions. *Analyze evidence to explain observations, make inferences and predictions. *Prepare models and/or computer simulations to: • Test hypotheses. • Evaluate how data fit. *Use oral and written language to: • Communicate findings. • Defend conclusions of scientific investigations.
Materials:	Virtual Lab - 1, Lab Worksheet
Anticipatory Set:	Today we will discuss and define composting and review the steps of Scientific Problem Solving. While our special focus will be on independent and dependent variables, we will examine constants and the use of a control experiment.
	During the Lesson
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Creating an abstract. Summarizing Data. Drawing Conclusions) Math (Creating a table, Organizing Data, Using Percents) Create, read and interpret tables, vocabulary Computer, Projector, PowerPoint, Internet
Modeling:	Review and define independent and dependent variables and the constant. Have students try to identify the independent and dependent variables and the constant in the composting experiment.
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.
Guided Practice:	Work together to create the question, observation, hypothesis, procedure and data steps of the scientific problem solving. Assist the students toward understanding their responsibilities in the analyze data and drawing conclusions phases of the experiment.
	After the Lesson
Independent Practice	Students will write the analyze data and conclusion paragraphs of the abstract.
	<b>Advanced Learners</b> should be able to determine the control, constants, independent and dependent variables for the "next" experiment that they have declared in the conclusions section of their abstracts.
Closure / Assessment:	Selected students will share their analyze data and conclusion paragraphs of the abstract.

Integration with School-wide Focus: Improve Reading and Writing performance

Compost Efficiency								
Brown/Green	Water	Turns	Efficiency	# of Days until Compost is Ready				
50%	25%	*0						
50%	25%	1						
50%	25%	2						
50%	25%	4						
50%	25%	8						
50%	50%	*0						
50%	50%	1						
50%	50%	2						
50%	50%	4						
50%	50%	8						
	*Cor	ntrol for th	ne experiment					

	Compost Efficiency									
Brown/Green	Water	Turns	Efficiency	# of Days until Compost is Ready						
50%	25%	*0								
50%	25%	1								
50%	25%	2								
50%	25%	4								
50%	25%	8								
50%	50%	*0								
50%	50%	1								
50%	50%	2								
50%	50%	4								
50%	50%	8								
	Con	trol for th	e experiment							

## **Science Objectives**

# 1.01, 2.02

Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.

At least as far back as the Greek philosopher, Plato, humans have known and declared that "NECESSITY IS THE MOTHER OF **INVENTION - Dire situations inspire ingenious solutions. If worse** comes to worst, people will apply all their imagination and skill to deal with the problem." This being historically true, we look at one of the most dire problems facing mankind today - energy for the 21st Century. As many of you know, the world is probably going to run out of oil during your lifetime. This energy will be replaced by an alternate source. The question is, should we do something about it now - before it is truly a dire need - or wait and solve the problem when it becomes a dire need?

(decision making)

### Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan Science, Engineering and Technology

NAME: Date: Subject: Science

Grade Level (s): 6

#### Standards/ Objectives Addressed (NCSCOS)

1.01, 2.02

Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.

Essential Question(s) (In student-friendly terms)

At least as far back as the Greek philosopher, Plato, humans have known and declared that "NECESSITY IS THE MOTHER OF INVENTION - Dire situations inspire ingenious solutions. If worse comes to worst, people will apply all their imagination and skill to deal with the problem." This being historically true, we look at one of the most dire problems facing mankind today - energy for the 21st Century. As many of you know, the world is probably going to run out of oil during your lifetime. This energy will be replaced by an alternate source. The question is, should we do something about it now - before it is truly a dire need - or wait and solve the problem when it becomes a dire need? (decision making)

#### Assess (Look at student data to plan. Use formative and/ or summative assessments.)

Examine student readiness and mastery grade level reading and evaluation. Students will need assistance with evaluation procedures.

#### High Yield Instructional Strategies (check all that apply to the lesson)

Identifying similarities and differences	✓	Reinforcing effort and providing recognition	<b>√</b>	Nonlinguistic representation	Setting objectives and providing feedback	~	
Questions, cues, and advance organizers	√	Summarizing and note taking	~	Cooperative learning	Generating and testing hypotheses	~	
Homework and practice	~						

#### Learner Diversity

• How will you differentiate to meet the needs of all learners in your class?

504 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.

#### Engage (Anticipatory Set)

• Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.

Today we will learn how we use Science and Technology in many ways every day. With your peer partner, create a T-table to show examples of what you currently consider Science and Technology.

#### Instructional Practices Used in this Lesson

Coaching		<ul> <li>Providing Directions/</li> <li>Instructions</li> </ul>		Learning Centers	
Discussion	~	Providing opportunities for practice	~	Teacher-directed Questions and Answers	<ul><li>✓</li><li>✓</li></ul>
Hands-on experiences		Direct Instruction	✓	Modeling	✓
Presentation	✓	Testing	✓	Other: Science6.org	✓

Suggested brained-based learni	na aoti	vitios promoting the abo	vo Instructional Practicos			
Think-Pair-Share		Instructional Games	Music/Rhyme/Rhythm/Rap			
Thinking Maps		Student Facilitators	Movement			
Technology Integration	✓	Storytelling	Humor			
Use of visuals	✓	Field Trips(Virtual)	Project/Problem - Based Learning	✓		
Metaphor/Simile/Analogy		Reciprocal Teaching	Mnemonics			
Peer/Self Assessment	✓	Drawing or illustrating	Other:			
Writing/Reflecting/Journals	✓	Simulations/Role Play	Other:			
<b>Type(s) of Grouping Used</b> _✓_small group _✓_stude		rs _⊻_whole group	_∡_individual			
<ul> <li>Involve students in an a</li> <li>Use reflective activities</li> <li>Give students time to th</li> </ul>	<b>you (</b> sed eve nalysis to clari ink, pla tunity t	ry 5-15 minutes to keep s of their explorations. Ify and modify student u an, investigate and orga to expand and solidify th	the students' brains engaged.	or		
	Jre) e lessor	<ol> <li>Are students able to a</li> </ol>	nswer the Essential Question(s)?			
<ul> <li>What assessment(s) with</li> </ul>	l be us	ed to be sure the studer				
•			hould "Google" the term and le	arn		
as much about prototypes						
			they should consider whether t			
manufacturer needed a pr	ototy	pe before productio	n and if so, what type of protot	уре		
was most likely used (com	puter	r simulation, scale n	nodel, full sized working prototy	/pe		
or a combination).						
<ul> <li>Describe, Analyze, Reflect:         <ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson's effectiveness?</li> </ul> </li> </ul>						
<ul> <li>What learning did you ta differently next time?</li> </ul>	ake fro	m this lesson to apply to	future lessons? What would you do			

Date:	

#### Science, Engineering and Technology

Econtial Question:	At logat as far back as the Creak philosopher Dista humans have known and				
Essential Question:	At least as far back as the Greek philosopher, Plato, humans have known and declared that "NECESSITY IS THE MOTHER OF INVENTION - Dire situations inspire ingenious solutions. If worse comes to worst, people will apply all their imagination and skill to deal with the problem." This being historically true, we look at one of the most dire problems facing mankind today - energy for the 21st Century. As many of you know, the world is probably going to run out of oil during your lifetime. This energy will be replaced by an alternate source. The question is, should we do something about it now - before it is truly a dire need - or wait and solve the problem when it becomes a dire need? (decision making)				
Objective (s) Numbers:	1.01, 2.02				
Outcomes:	Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.				
Materials:	Textbook pages 20-25, Presentation CD				
Anticipatory Set:	Today we will learn how we use Science and Technology in many ways every day. With your peer partner, create a T-table to show examples of what you currently consider Science and Technology.				
	During the Lesson				
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Restating questions in declarative format) Reading (prereading skills, vocabulary, dramatic presentation) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet				
Modeling:	Review and define the lesson vocabulary: scientist, engineer, constraint and prototype.				
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.				
Guided Practice:	Use the passage to find and define the vocabulary terms. Use author's craft procedures to determine what the author has spent extra money on and therefore what will be the most important aspects of the passage. Popcorn styled reading of the Science Passage with occasional breaks for further discussion and illustration.				
After the Lesson					
Independent Practice	Students will respond to the review questions on page 25 using the restate and explain method of response.				
	Advanced Learners may want to research prototypes. They should "Google" the term and learn as much about prototypes as possible. Then, choose 10 everyday pieces of technology from hammers to cars. For each piece they should consider whether the manufacturer needed a prototype before production and if so, what type of prototype was most likely used (computer simulation, scale model, full sized working prototype or a combination).				

Closure / Assessment: Selected students will share and discuss their responses to selected questions.

Integration with School-wide Focus: Improve Reading and Writing performance

## **Science Objectives**

# 1.01, 2.02

Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.

What steps do you think should be taken to ensure that a person is prepared for examination on a set of skills?

(action plan)

Wayne County Schools 21<sup>st</sup> Century Instructional Lesson Plan The Nature of Science and Technology Review and Assessment

NAME:	Subject: Science
Date:	Grade Level (s): 6
Standards/ Objectives Addressed (NCSCOS)	

1.01, 2.02

Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas. Essential Question(s) (In student-friendly terms)

What steps do you think should be taken to ensure that a person is prepared for examination on a set of skills? (action plan)

Assess (Look at student data to plan. Use formative and/ or summative assessments.)

Assess the series of review and evaluation materials that the students have produced during this unit. Pay special attention to areas of weakness or poor understanding.

#### High Yield Instructional Strategies (check all that apply to the lesson)

Identifying similarities and differences		Reinforcing effort and providing recognition	~	Nonlinguistic representation	Setting objectives and providing feedback	<b>~</b>	
Questions, cues, and advance organizers Homework and practice	✓ ✓	Summarizing and note taking		Cooperative learning	Generating and testing hypotheses		

#### Learner Diversity

• How will you differentiate to meet the needs of all learners in your class?

504 modifications ET and RA. Differentiated assignments and presentations will focus on remediation and enrichment of lower and higher ability groups.

#### Engage (Anticipatory Set)

• Capture the students' attention, stimulate their thinking and help them access prior knowledge. Consider novelty, meaning and emotion.

During our studies of this chapter we have discussed the differences between science, applied science and technology. We have examined the Scientific Method and practiced its application and we have learned about engineering and its applications to our daily lives. Today we will review and compile this information so that we will be better able to retain it for a long period of time.

#### Instructional Practices Used in this Lesson

Coaching	<b>~</b>	Providing Directions/	<b>√</b>	Learning Centers	
Discussion	~	Providing opportunities for practice	~	Teacher-directed Questions and Answers	✓ ✓
Hands-on experiences		Direct Instruction	✓	Modeling	$\checkmark$
Presentation	~	Testing	~	Other: Science6.org	$\checkmark$

Suggested brained-based learning	activities promoting the ab	ove Instructional Practices			
Think-Pair-Share	Instructional Games	Music/Rhyme/Rhythm/Rap			
Thinking Maps	Student Facilitators	Movement			
Technology Integration	Storytelling	Humor			
Use of visuals	Field Trips(Virtual)	Project/Problem- Based Learning			
Metaphor/Simile/Analogy	Reciprocal Teaching	Mnemonics			
Peer/Self Assessment	<ul> <li>Drawing or illustrating</li> </ul>	Other:			
Writing/Reflecting/Journals	Simulations/Role Play	Other:			
Type(s) of Grouping Used: small group _⊻_student pairs _⊻_whole group _⊻_individual					
<ul> <li>Explain, Explore, Elaborate</li> <li>Content Chunks: How will you divide and teach the content?</li> <li>Transitions should be used every 5-15 minutes to keep the students' brains engaged.</li> <li>Involve students in an analysis of their explorations.</li> <li>Use reflective activities to clarify and modify student understanding.</li> <li>Give students time to think, plan, investigate and organize collected information.</li> <li>Give students the opportunity to expand and solidify their understanding of the concept and/ or apply it to a real-world situation.</li> </ul>					
See next page for instructio	nal detail.				
<ul> <li>Evaluate (Feedback/ Closure)         <ul> <li>Evaluate throughout the lesson. Are students able to answer the Essential Question(s)?</li> <li>Present students with a scoring guide (such as a rubric) at the beginning to self-assess.</li> <li>What assessment(s) will be used to be sure the students are successful?</li> </ul> </li> <li>Assignment # 22 should be made into a poster and selected posters will be displayed.</li> </ul>					
<ul> <li>Describe, Analyze, Reflect: <ul> <li>How effective was the lesson? How did the strategies help the students deepen their understanding? Cite evidence of student work, performance, behaviors, and/ or remarks to support your view.</li> <li>What caused the lesson to go well? What challenges did you encounter?</li> <li>What did you do to contribute to the lesson's effectiveness?</li> </ul> </li> <li>What learning did you take from this lesson to apply to future lessons? What would you do differently next time?</li> </ul>					

Date:	Time Frame: 80 minutes				
	The Nature of Science and Technology Review				
Essential Question:	What steps do you think should be taken to ensure that a person is prepared for examination on a set of skills? (action plan)				
Objective (s) Numbers: Outcomes:	<b>1.01, 2.02</b> Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.				
Materials:	Textbook pages 4 - 31				
Anticipatory Set:	During our studies of this chapter we have discussed the differences between science, applied science and technology. We have examined the Scientific Method and practiced its application and we have learned about engineering and its applications to our daily lives. Today we will review and compile this information so that we will be better able to retain it for a long period of time.				
	During the Lesson				
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (Restating questions in declarative format) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet				
Modeling:	Review and discuss page 29. Help the students to see the connections between applied sciences, technology and engineering.				
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.				
Guided Practice:	Discuss the instructions for the review on pages 30-31. Help the students to see the importance of validating their answers. Discuss the previous year's EOG weakness in Cognition, discuss the steps that we took to make improvements and implore them not to allow these improvements to slip.				
After the Lesson					
Independent Practice	Students will complete the review on pages 30-31 (1-22)				
Closure / Assessment:	Assignment # 22 should be made into a poster and selected posters will be displayed.				

Integration with School-wide Focus: Improve Reading, Writing and Math performance. Focus on Cognition (6th grade area of weakness 2006)

Date:	Time Frame: 80 minutes				
	The Nature of Science and Technology Assessment				
Essential Question:	If you could press restart, what would you do differently to prepare for today's exam? (decision making)				
Objective (s) Numbers: Outcomes:	<b>1.01, 2.02</b> Use information systems to: Identify scientific needs, human needs, or problems that are subject to technological solution. Locate resources to obtain and test ideas.				
Materials: Anticipatory Set:	Textbook pages 4 - 31 During our studies of this chapter we have discussed the differences between science, applied science and technology. We have examined the Scientific Method and practiced its application and we have learned about engineering and its applications to our daily lives. Today you will be assessed on your knowledge of these objectives.				
	During the Lesson				
Presentation of Information: Integration of Other Subjects: Integration of Reading: Integration of Technology:	Writing (evaluation) Reading for information and interpretation. Computer, Projector, PowerPoint, Internet				
Modeling:					
Differentiation:	504 modifications ET and MA. Student and teacher modeling will help to guide all students to reach expected outcomes.				
Guided Practice:	Discuss and correct the review from pages 30-31. Clarify any confusion.				
After the Lesson					
Independent Practice	Assign the EOG style assessment on pages 32-33.				
Closure / Assessment:	The students will write a performance assessment paragraph. The paragraph should discuss the effectiveness of their studies during each of the phases of the presentation of this material. 1. Prereading/Author's Craft 2. Reading of the Selection 3. Review Exercises 4. Lab Participation 5. Rate your performance on this exam.				

Integration with School-wide Focus: Improve Reading, Writing and Math performance. Focus on Cognition (6th grade area of weakness 2006)