

VA State Nature of Science SOL Institute Workshop PLANNER

TOTAL TIME = 120 MIN	DESCRIPTION/PURPOSE	ACTIVITY - NOTES FOR PRESENTER	MATERIALS/EQUIPMENT
5 min	Set the stage for learning about NOS and perhaps uncover some misconceptions	- Hand out the Anticipation-Reaction Guide and instruct participants to fill in just the Anticipation portion - Allow 1 minute each for participants to share their thoughts with a partner (optional)	PPT on thumb drive Laptop Extension cord LCD projector Anticipation/Reaction Guide (one for each participant)
1 min	Slides 1 & 2 of the Presenter Notes Introduction [Presenter Notes pages 1-2]	- Read the info on pages 1 & 2 of the Presenter's Notes to let participants know that they will create a graphic and short, catchy phrase to go with each NOS component AFTER the PPT - Hand out notetaking paper (copy paper or post-it notes) and instruct participants to jot down their ideas during the PPT to use for their graphic and catchy phrases - Start the PPT and pause at slides 1 & 2 to let the words and graphics sink in	Paper for notetaking Pencils or pens if needed
5 min	Slides 3, 4, & 5-6 The Natural World is Understandable [Presenter Notes pages 3-5]	- Advance to slide 3: The Natural World is Understandable and pause to let the words and graphic sink in - Advance to slide 4 and slowly read the information in the Presenter Notes. - DO NOT show slide 5 but DO read the Example/Illustration for The Natural World is Understandable. Read this in a "story telling" manner to make it engaging - Give participants a minute or so afterward to jot down their thoughts about a possible graphic and catchy phrase	
6 min	Slides 7, 8, 9 & 10 Science Demands Evidence	- Advance to slide 7: Science Demands Evidence and pause to let the words and graphic sink in - Advance to slide 8 and slowly read the information in the Presenter Notes. (the information on the slide is just a short summary of this information).	

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		3. Advance to slide 9 and read the info in the Presenter Notes . 4. DO NOT show slide 10 – just read the Example/Illustration to help participants make connections between this component of NOS and the history of science	
5 min	[Presenter Notes pages 6-8] Slides 11, 12, & 13 Science is a Blend of Logic and Imagination [Presenter Notes pages 9-10]	1. Advance to slide 11 and pause to let the words and graphic sink in 2. Advance to slide 12 and read the info in the Presenter Notes . 3. DO NOT show slide 13 but DO read the information to the participants from the Presenter Notes .	
4 min	Slides 14, 15, & 16 Scientific Knowledge is Durable [Presenter Notes pages 11-12]	1. Advance to slide 14 and pause... 2. Advance to slide 15 and read the info in the Presenter Notes . 3. Advance to slide 16 and read the info in the Presenter Notes . No Example/Illustration is included for this component of NOS because it is so evident in the history of science. Also, there are many discussion scenarios in the group work section of this workshop that highlight this key component of NOS.	
6 min	Slides 17, 18, 19, & 20 Scientific Knowledge is Subject to Change [Presenter Notes pages 13-15]	1. Show slide 14 and pause 2. Advance to slide 15 and read the info in the Presenter Notes . 3. DO NOT show slides 19 & 20 but DO read the story of plate tectonics	
4 min	Slides 21, 22, & 23 Science Avoids Bias [Presenter Notes pages 16-17]	By now you have the idea...pause at the opening slide with the cool graphic, read the detailed info in the Presenter Notes of the second slide and then read the example without showing the hidden slide.	

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4 min TOTAL OF ~40 MIN TO HERE	Slides 24, 25 & 26 Science is a Complex Social Activity [Presenter Notes pages 18-20]	Show the slides and read the info	
	Slide 27 [Presenter Notes pages 20]	Read the Summary slide and ask them to think about each of the components of NOS	
15 Min	Create Graphic and Phrase	1. Keep slide 27 up on the screen 2. Hand out the Graphic and NOS Discussion Qs sheet 3. Instruct participants to create a graphic and catchy phrase for each of the 7 components of NOS. They should spend only about 2 min per item!	Graphic and NOS Discussion Qs Colored pencils
20 Min TOTAL OF ~80 MIN TO HERE	Apply understanding of NOS using scenarios	1. Pass out one set of Discussion Scenarios to each table. 2. Instruct participants to work in pairs of groups of 4 to read the scenarios in order and determine which of the 7 components of NOS are highlighted in the scenario. a. It might be helpful to have <u>each person in the group take turns reading the scenario</u> while the other use their graphic to determine which NOS components are highlighted. 3. When consensus is reached, groups should post their answers on the large sheet of newsprint for other groups to see. This way other groups can check their understanding AND it builds in some accountability	Markers Newsprint of large post-it paper Masking or scotch tape

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15 Min	How will participants help their students learn about NOS?	1. Point out to participants that there are questions on the back of the Graphic that are designed to be used by students to analyze their lab investigations in THE SAME MANNER that participants just did with the scenarios 2. If time allows, ask participants to think of an upcoming investigation and determine which of the 7 components of NOS are most evident. 3. How will they use the PPT or other materials with their students?	BACK of the Graphic and NOS Discussion Qs Post-its (optional)
10 Min TOTAL OF ~105 MIN TO HERE	Participants reflect on what new information they have learned and how their ideas have changed	1. Participants return to the Anticipation/reaction Guide and fill out the Reaction portion 2. Participants share with a partner how their ideas about NOS have CHANGED as a result of this presentation	Anticipation/Reaction Guide (participants use the same sheet they started with at the beginning of the workshop)

Master List of Materials and Equipment:

- Laptop computer
- Extension cord
- LCD projector
- PPT for NOS
- 1 Anticipation-Reaction guide for each participant
- 1 sheet of blank copy paper or lined notebook paper for notetaking during PPT
- 1 Graphic & Discussion Qs for each participant
- Post-it notes for each group (optional)
- 1 large sheet of newsprint or poster-sized post-it paper for each group
- Masking or scotch tape
- Assorted markers for each group
- Assorted colored pencils for each group
- 1 evaluation sheet for each participant