Academic Adaptations for Adolescents with Autism and Asperger's

Science

For use in ASD Nest middle and high schools

INTRODUCTION

Middle and high school students with ASD may struggle with academic expectations across subjects. Though bright, there can be content or skills that can pose a challenge to these students.

These struggles, however, can often be predicted by considering underlying challenges that students with ASD face. Teachers can also support students by incorporating their strengths and areas of interest.

The A5: Academic Adaptations for Adolescents with Autism and Asperger's provides specific strategies to help support students in the ASD Nest program. Along with the *Nest Essentials* and the *Expanded Nest Essentials*, these documents are the primary strategy resources for teachers in the ASD Nest program. Many of the strategies in these documents are also supportive of other students in Nest classes, whether diagnosed with another special need, or a general education student.

Middle and high school teachers in the ASD Nest program have worked to compile this document, the **A5**. In it you will find a well-organized collection of strategies—including concrete examples—that consider students' underlying challenges and support students using areas of strength.

TABLE OF CONTENTS

Common Strengths of Students with ASD

Students on the autism spectrum do often face challenges in social and academic aspects of the school day. However, they also possess strengths that can support these difficulties. Only a partial list, the strengths listed below can be incorporated into supports and strategies teachers create for students. Note that these are not universal; as with any student, teachers must get to know individual children to best know how to support them.

Visual Thinking

Students on the autism spectrum are often visual thinkers. Incorporating icons, symbols, written directions, and other visuals can help students access content.

> *Sometimes I need more "eyes on" type of learning.*
>
> – 6th grade Nest student

Structures & Routines

Students with ASD are often comforted by predictability. It benefits students to use consistent classroom routines, as well as clear charts and visuals.

> *When you know what's coming you can be ready to act accordingly.*
>
> – 7th grade Nest student

Detail-oriented

When reading informational text, analyzing photographs, or engaging in discussion, students with ASD often pick up on details in information. Note that students may struggle to see the "big picture" which should be explicitly supported.

> *The forest for the trees? Sometimes I can see the veins on the leaves of the trees.*
>
> – adult with Asperger's

Reading

Though they may struggle with aspects of comprehension, many students on the autism spectrum have advanced decoding skills. Some have an interest and affinity for unique vocabulary.

> *I had picked up a copy of 'A Midsummer Night's Dream.' I opened the book and began to read it fluently. How weird is that?*
>
> – Like Jackson, 'Freaks, Geeks and Asperger Syndrome'

Math

Many students with ASD are quite proficient with computers and other technology. Allowing students to use computers, iPads, or other technology in the classroom or for homework can help with motivation as well as offer a better way for students to demonstrate their understanding.

> *We get a real kick out of numbers, us people with autism. Numbers are fixed, unchanging things. The number 1, for example, is only ever, ever the number 1. That simplicity, that clearness, it's so comforting to us.*
>
> – Naoki Higashida, 'The Reason I Jump'

Computers & Technology

Many students with ASD are quite proficient with computers and other technology. Allowing students to use computers, iPads, or other technology in the classroom or for homework can help with motivation and offer a better way for students to demonstrate their understanding.

> *With a laptop it is easier for me to review my work and it is neater when I make corrections.*
>
> – 6th grade Nest student

Logic

Students on the autism spectrum often show a preference for logic and reason. Showing how some content is rule-bound can play into their learning style.

> *I finally understood why so many people allow emotions to distort the facts. My mind can always separate the two. Even when I am very upset, I keep reviewing the facts over and over until I can come to a logical conclusion.*
>
> – Temple Grandin, 'Thinking in Pictures'

Special Interests

Students with ASD often have an area of special interest. These special interest areas or "passions" range from common cartoon or movie characters to particular animals or historical time periods to train schedules. By identifying, understanding, and incorporating a student's passion, teachers can increase motivation, make content more accessible, and help students feel understood and included.

> *I wish that other people… knew that whenever I'm around horses, I don't think about anything else. Like if I was stressed about one thing, and I went to see a horse or get on a horse, that thing I was stressed about, I wouldn't be stressed about anymore.*
>
> – Sarah, child with Asperger's (Messier et al, 2007)

For more information on incorporating special interests, see:

Lanou, A., Hough, L., & Powell, E. (2012). Case studies on using strengths and interests to address the needs of students with autism spectrum disorders. *Intervention in School and Clinic*, 47(3), 175-182. Available at http://steinhardt.nyu.edu/asdnest/professionals/publications

Common Challenges of Students with ASD

Behind the observable academic difficulties a Nest student may demonstrate is often one or more core challenges that are characteristic of individuals with ASD. Below are some of the common underlying challenges that students on the autism spectrum face.

CENTRAL COHERENCE

seeing the "big picture"

appraising the relative importance of details and the main idea

understanding the relevance of character traits, keeping in mind how a small part of a project connects to the completed end product

EXECUTIVE FUNCTIONING

employing multiple cognitive actions to work towards a goal

includes planning, organizing, prioritizing, time management

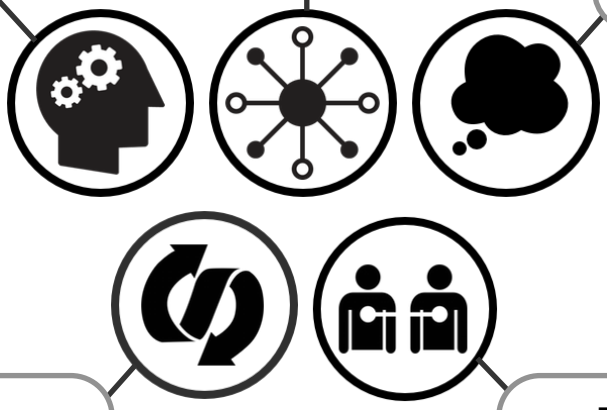
keeping an organized binder, planning out time to work on a long-term project

THEORY OF MIND

perspective taking; evaluating the thoughts, feelings, and motivations of others

involves self-awareness: an understanding of your emotions and actions and how they impact yourself and others

making reasonable guesses about character motivation, determining why a historical acted as s/he did



COGNITIVE FLEXIBILITY

thinking in new and unexpected ways, and breaking of routines when necessary

considering multiple ways to respond to a problem, and shifting gears to formulate best-fit solutions to problems

using multiple methods to solve a math problem, correcting the mistakes of another student's work

EXPERIENCE SHARING

connecting with others over: shared experiences, memories, emotional reactions, intended actions, ideas

includes episodic memory: personal representational memory anchored by the emotional connection

participating as others do in class activities, recalling personal memories or emotions (such as "a time I was proud of myself")

NOTE: This does not cover all potential challenges for students with ASD. Others include *sensory sensitivities, self-regulation, social-emotional needs, etc*. However, the focus of this document is on underlying challenges that can impede learning of subject-specific skills & content, not broader classroom functioning. For more information about general classroom supports, see the **Expanded Nest Essentials**, which includes supports for group work, classroom routines, self-regulation, and more.

Partially adapted from the work of S Gutstein

SCIENCE

Possible Struggle	State Standard
Analyzing information for relevant information and identify themes	1
Identify relationship between variables	1
Extrapolate information from data to create and validate conjectures	1
Formulate questions for scientific investigation to explain natural phenomena	1
Recognize commonalities in relationships and systems	6
Use commonalities and patterns to make predictions	6, 7
Identify cause and effect relationships	4
Compare and contrast concepts, principles and theories	4
Reading non-fiction text	ELA Reading standards
Writing a Lab Report	ELA Written standards
Vocabulary	10
Creating Models	7

Due to challenges in:

Students with ASD may struggle with:

Analyzing information for relevant information and identify themes supported by that information (S 1)

CCSS.ELA-Literacy.RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

General Suggestions:

- ✓ Focus extra attention on irrelevant information so students learn how to eliminate details
- ✓ Provide a list of words that identify significance (due to, most important, in general)
- ✓ Provide graphic support for organization of details that support one specific theme/concept/principle

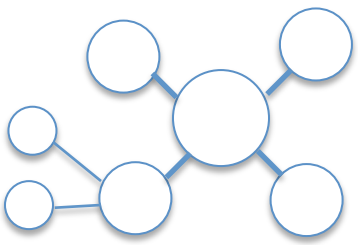
Additional Strategies:

Use a visual model or collage to teach the concept of theme, and that some details are more or less relevant to the big picture

Use "boxes and bullets" template and web-style graphic organizers to show relationships between main ideas and supporting details

Theme:

- detail
- detail
- detail



Due to challenges in:

Students with ASD may struggle with:

Identify relationships between variables (S 1)

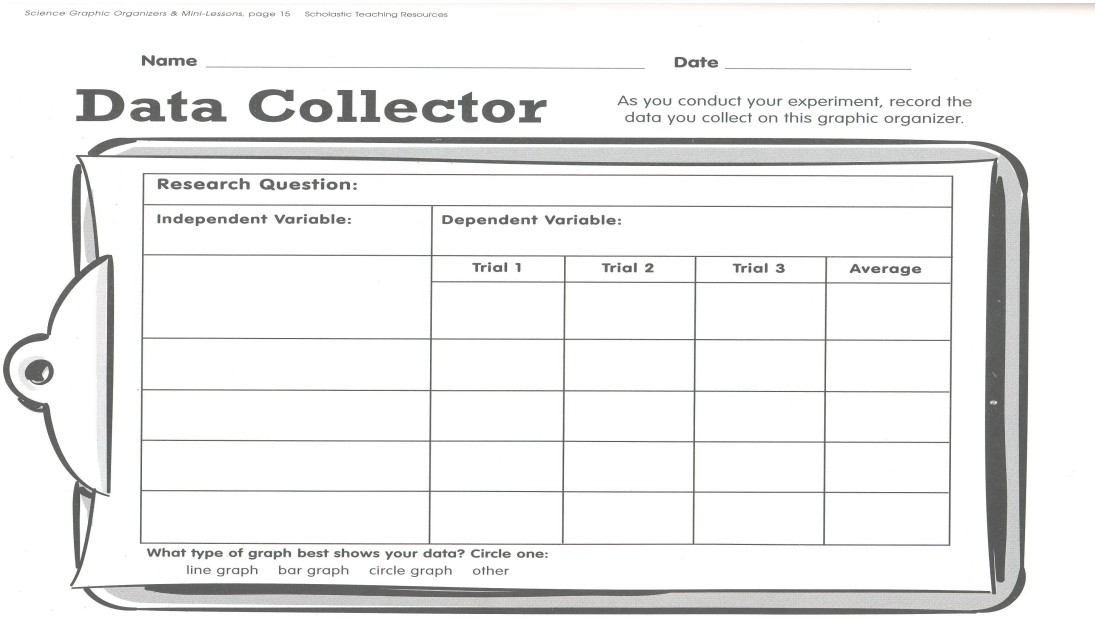
CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks

General Suggestions:

- ✓ Use special interest references to introduce differences between objects and how those differences lead to different outcome. (e.g. Mario vs Luigi or transformers)
- ✓ Begin by focusing on identifying/labeling control(s) in the environment, remember to introduce familiar synonyms [constant, unchanging, same] to narrow focus on variables
- ✓ Introduce independent versus dependent variables through cause and effect relationships. Give familiar examples of daily events/routines (e.g. If my nose tickles, then…).
- ✓ Use graphic organizers and tables to collect relevant data and visualize changes

Additional Strategies:

Use consistent organizers to break down the relationships between variables



Science Graphic Organizers & Mini-Lessons, page 15 Scholastic Teaching Resources

Name _____ Date _____

Data Collector

As you conduct your experiment, record the data you collect on this graphic organizer.

Research Question:				
Independent Variable:	Dependent Variable:			
	Trial 1	Trial 2	Trial 3	Average

What type of graph best shows your data? Circle one:
line graph bar graph circle graph other

Scholastic: Science Graphic Organizers, Maria L Chang

Due to challenges in:

Students with ASD may struggle with:

Extrapolate information from data to create and validate conjectures (S 1)

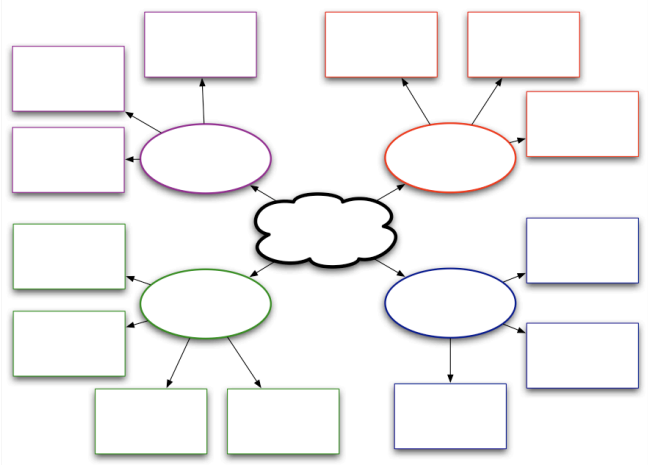
CCSS.ELA-Literacy.RST.6-8.1 Cite specific textual evidence to support analysis of science and technical texts

General Suggestions:

- ✓ Practice concept of developing a "smart guess" (SDI concept) or hypothesis by using what you know to predict something
- ✓ Use their special interest to begin practicing making a "smart guess"
- ✓ Provide a framework for the organization and language used for conjectures
- ✓ Use sentence starters ("if.... then.... because...")

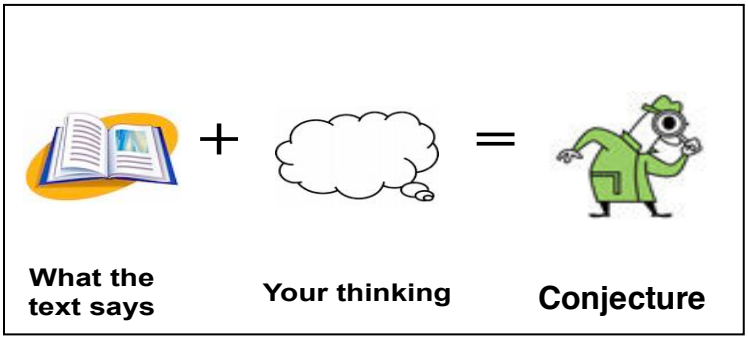
Additional Strategies:

Provide visuals/graphic organizers to gather and categorize information from data



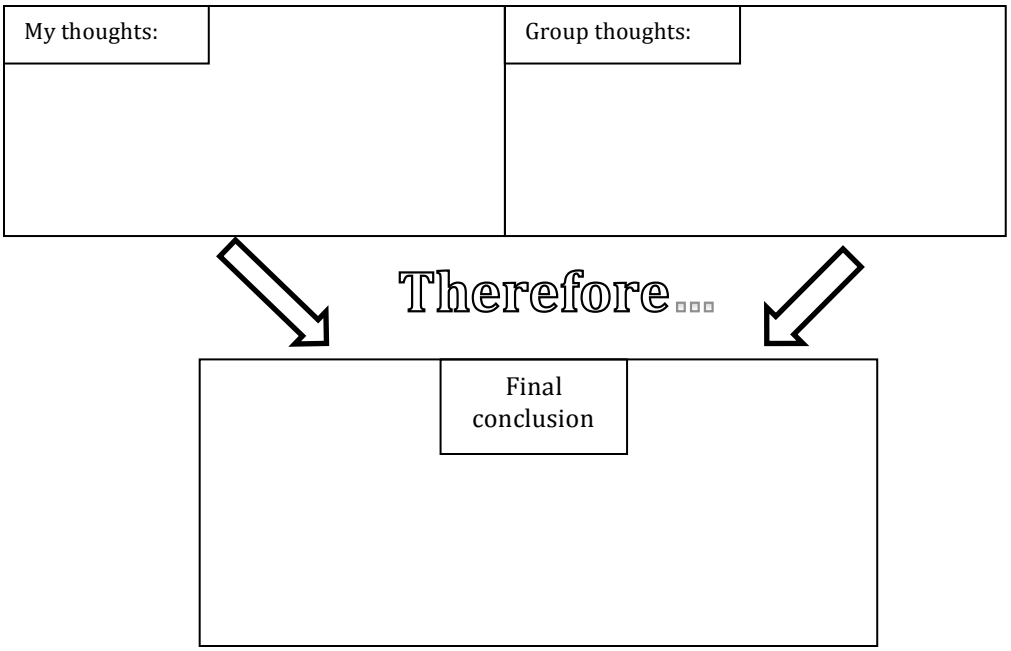
A Lanou

Use visuals to demonstrate abstract concepts

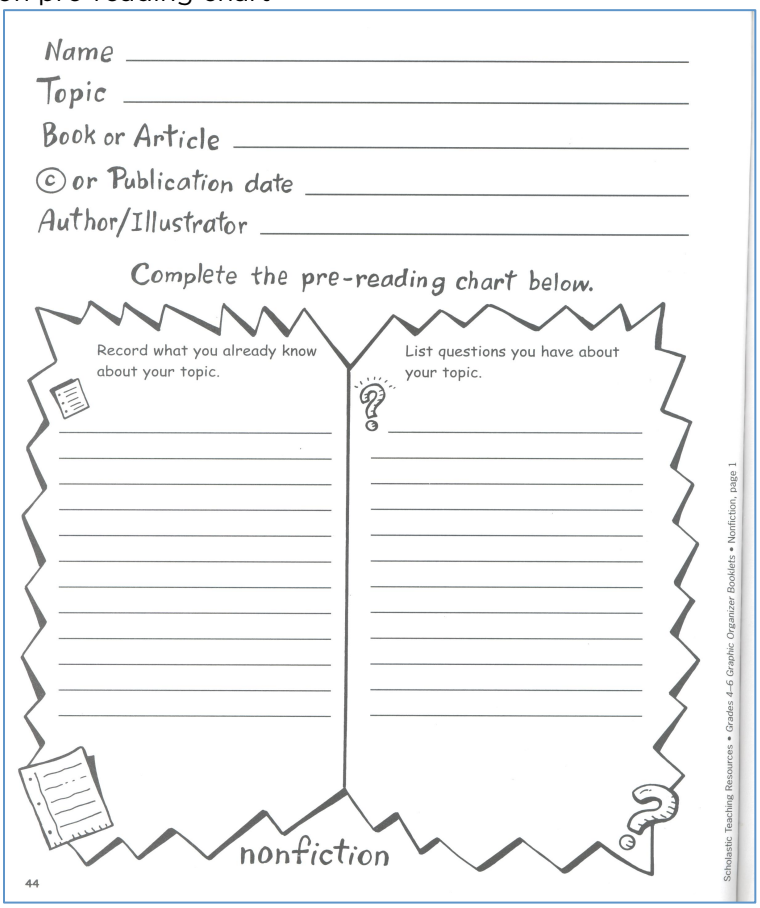


A Lanou / L Hough

Provide graphic organizers to break down combining conclusions



Use a non-fiction pre-reading chart


Name _____
Topic _____
Book or Article _____
© or Publication date _____
Author/Illustrator _____

Complete the pre-reading chart below.

Record what you already know about your topic.

List questions you have about your topic.

nonfiction

44

Scholastic Teaching Resources • Grades 4–6 Graphic Organizer Booklets • Nonfiction, page 1

Scholastic Teacher Resources: Grades 4–6 Graphic Organizer Booklets

Due to challenges in:

Students with ASD may struggle with:

Formulate questions for scientific investigation to explain natural phenomena (S 1)

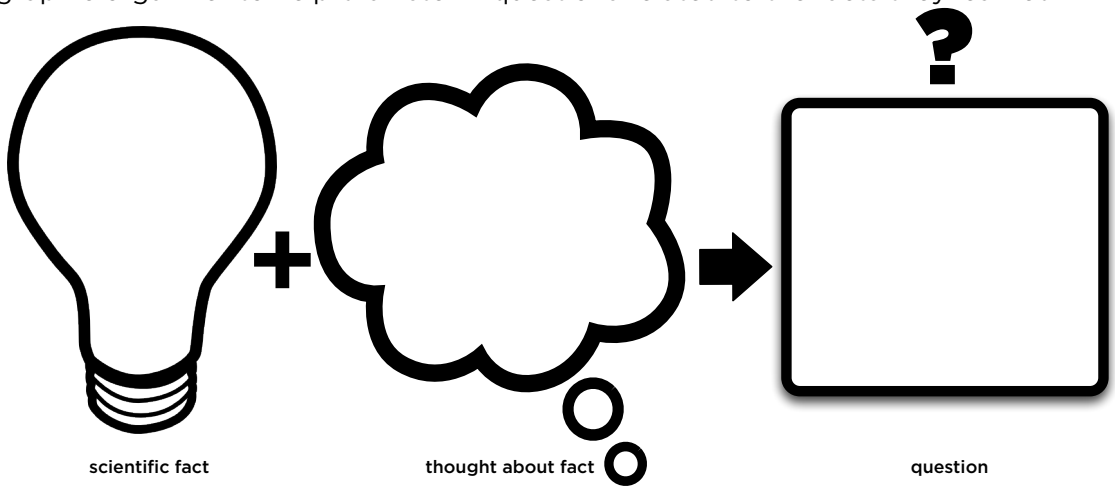
CCSS.ELA-Literacy.RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text

General Suggestions:

- ✓ Differentiate between fact and opinion in order to create a question that can be investigated and explained
- ✓ Teach a specific framework to analyze if questions are able to be investigated
- ✓ Provide examples of questions and have them evaluate if they are "good or bad"
- ✓ Then provide narratives and have students develop "good" questions based on examples. Have students work in partners to analyze if the questions meet the framework criteria.
- ✓ Help students organize their thoughts, use visuals for abstract language (thoughts to form questions)
- ✓ Provide language to guide discussions
- ✓ Use sentence starters: "When I think about….I wonder…"

Additional Strategies:

Use a graphic organizer to help brainstorm questions related to the facts they learned.



Gorman/Brown/Lanou

Provide structure of what makes a good question; test examples and non-examples

Question

What are "good" science questions?

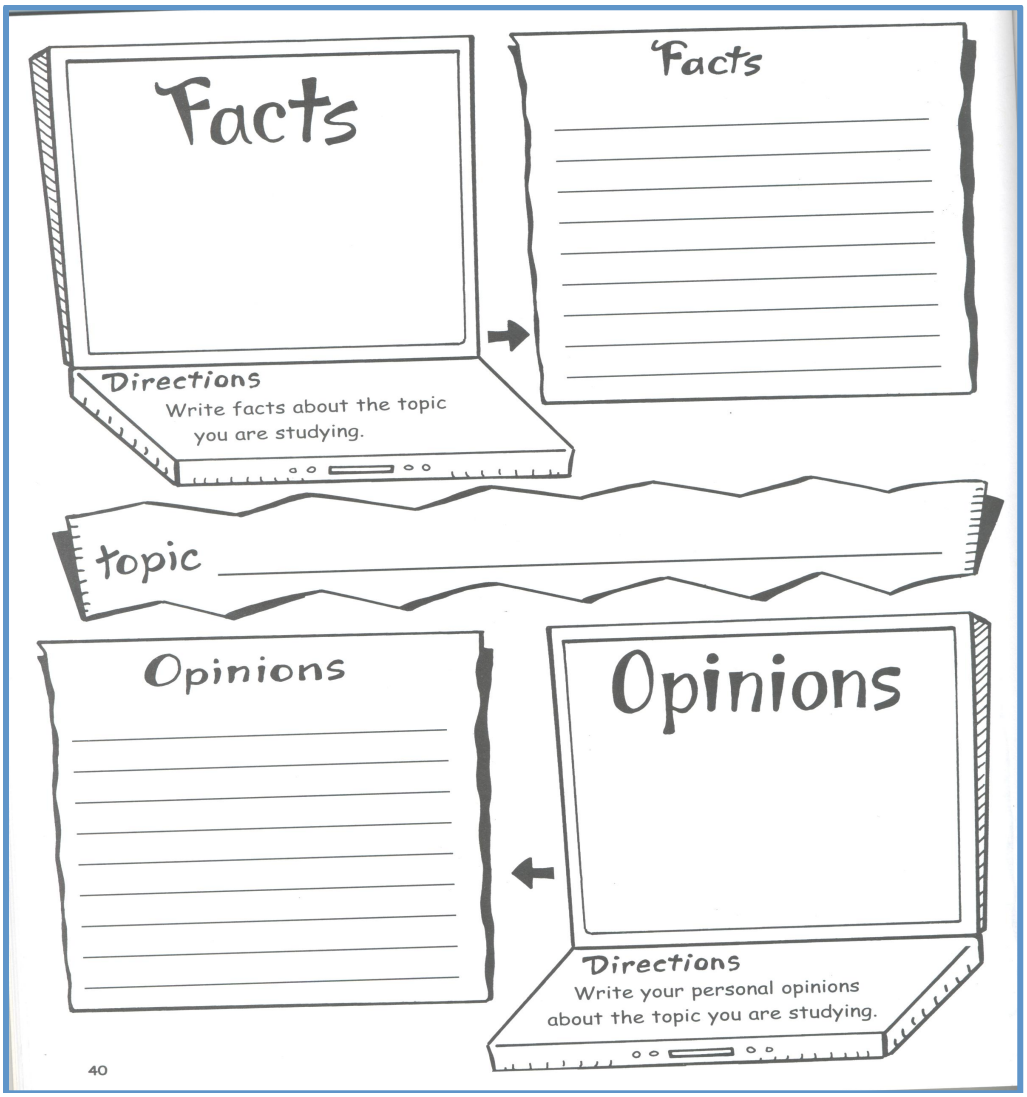
1) "Good" science questions can be **tested**.
2) You can **measure** the results.
3) You can **apply** your answer to something else.

Gorman, Diaz

Good Question	Bad Question
• Measurable • Science related • Answerable (nothing impossible)	• Complicated • Opinion • Impossible

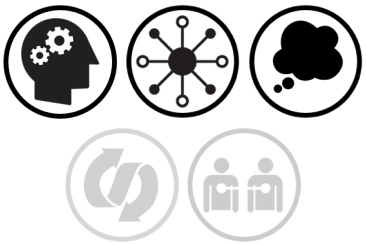
D Gorman

Use visuals or graphic organizers to distinguish between facts and opinions



Scholastic: Science Graphic Organizers

Due to challenges in:



Students with ASD may struggle with:

Recognize commonalities in relationships and systems (S 6)

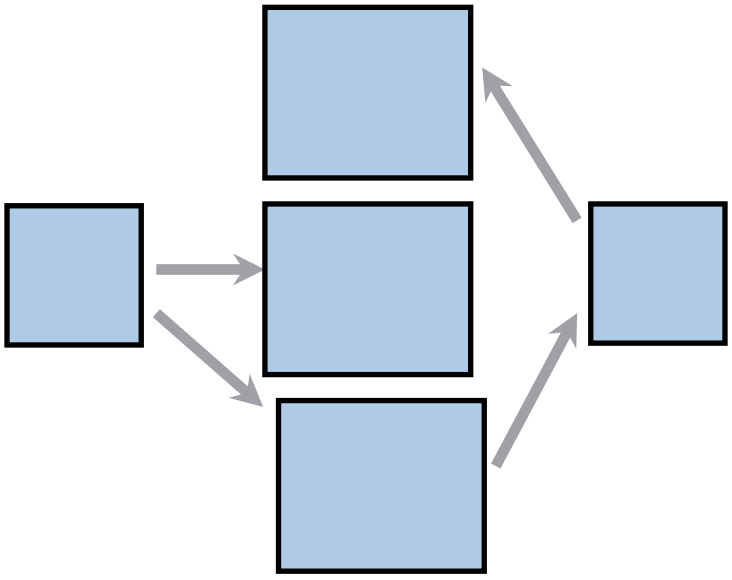
CCSS.ELA-Literacy.RST.6-8.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions

General Suggestions:

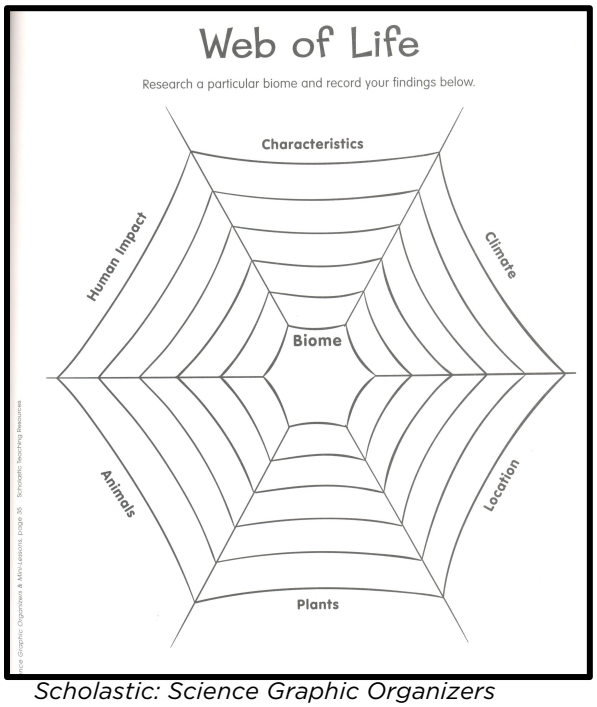
- ✓ Teach the concept of interdependence and how things impact one and other in a system by having them explore their daily relationships (e.g. where does your food come from? What happens if there were no adults?)
- ✓ Teach commonalities by first comparing daily routines around the world to demonstrate how everyone relies on the same natural resources. (e.g., you vs. students in Japan)
- ✓ Use kinesthetic activities to demonstrate interconnected relationships (e.g., yarn connecting students and what happens when one connection is cut)
- ✓ Provide graphic organizers to compare systems and relationships

Additional Strategies:

Use visuals to track relationships



Gorman & Brown

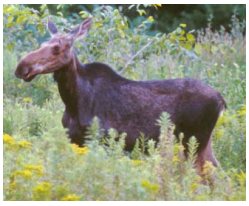


Scholastic: Science Graphic Organizers

Use visuals to support classification

EXAMPLE of classification using OBSERVABLE STRUCTURE






Does the organism have HORNS?

YES


NO


Gorman

Due to challenges in:

Students with ASD may struggle with:

Use commonalities and patterns to make predictions (S 6 & 7)

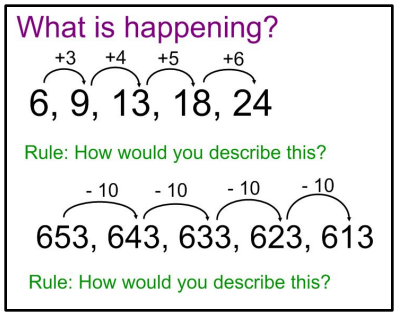
CCSS.ELA-Literacy.RST.6-8.8 Distinguish among facts, reasoned judgment based on research findings, and speculation in a text

General Suggestions:

- ✓ Teach a routine for creating a hypothesis by filling in an "if-then-because" narrative
- ✓ Provide examples of the "if" and "then" using familiar routines to have students explore the relationship and predict the "because" (e.g., "If I eat chocolate, then I get pimples, because…")
- ✓ Develop the concept of making predictions based on patterns by using visuals to predict what might come next (i.e., shapes or numbers)
- ✓ Provide a demonstration with unexpected results and have students create and then evaluate their own predictions of what might happen next (e.g., *How many drops of water fit on the face of a penny?* Before testing it, students predict the number of drops)

Additional Strategies:

Use visuals to start identifying simple patterns and applying them to the next concept



Teach a framework for how to create a hypothesis including "if-then-because"

- ⊡ A hypothesis:
  - Must be testable
  - Is based on prior knowledge
  - Tests (at least two) variables
  - Needs to be written as an "If…then…**because**" statement

Gorman

Due to challenges in:

Students with ASD may struggle with:

Identify cause and effect relationships (S 4)

CCSS.ELA-Literacy.RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks

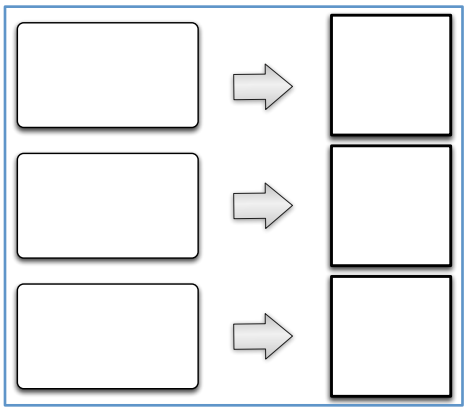
CCSS.ELA-Literacy.RST.6-8.6 Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text

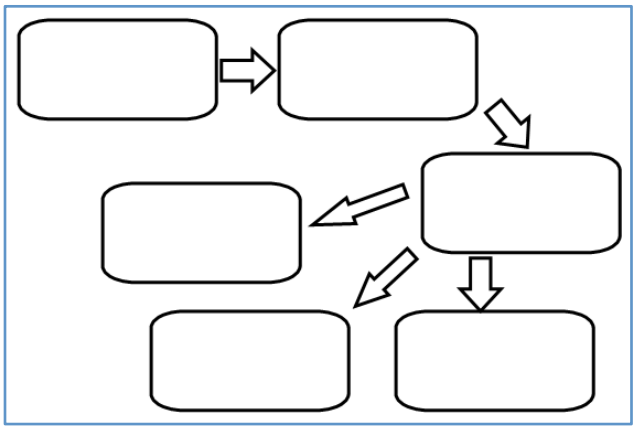
General Suggestions:

- ✓ Facilitate a fishbowl activity in which students model a scientific concept while other students observe, analyze, and later discuss
- ✓ Add physical gestures and movements to help label the moment and promote memory recall when referring back to the relationship (e.g., When a liquid gets colder the atoms get closer together—so have them hug themselves. For heat have them fan themselves to represent spreading)
- ✓ Use comic strips to draw out relationships using specific frames to represent parts of the whole sequence.
- ✓ Use graphic organizers to visually represent relationships. Start with simple, one to-one-correspondence, and move to more complex relationships.
- ✓ Use charts with multiple arrows to teach further predictions. Then "rewind" to understand that one cause may have multiple or conflicting effects.

Additional Strategies:

Use graphic organizers, starting with simple and building to more complex relationships





Gorman/Brown/Lanou

Due to challenges in:

Students with ASD may struggle with:

Compare and contrast concepts, principles and theories (S 4)

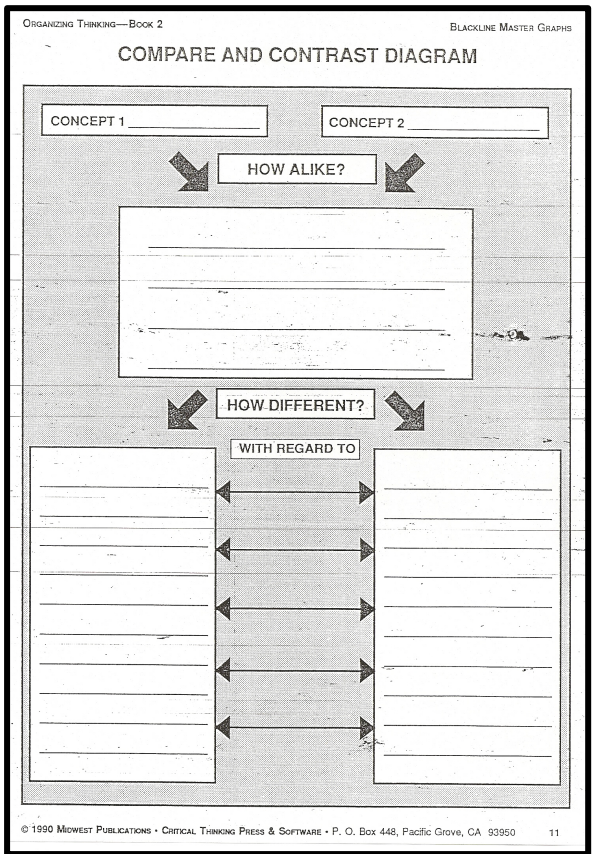
CCSS.ELA-Literacy.RST.6-8.9 Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic

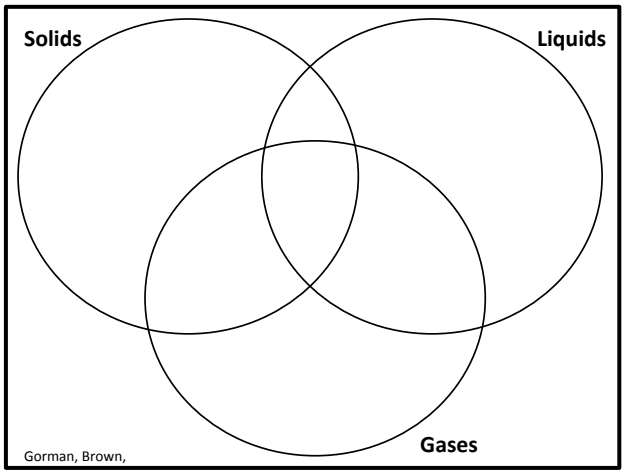
General Suggestions:

- ✓ Conduct a debate in which students move to sides of the room to display their opinion with evidence
- ✓ Clearly define the meaning of "compare" and "contrast" using familiar terms (e.g., similarities, differences)
- ✓ Use topics of interest for students to practice the concept (e.g., Simpsons vs. Family Guy, Different environments or biomes)
- ✓ Use visuals such as a concept webs or Venn diagrams

Additional Strategies:

Use graphic organizers to compare various topics





Midwest Publications: Critical Thinking Press & Software

Due to challenges in:

Students with ASD may struggle with:

Reading non-fiction text

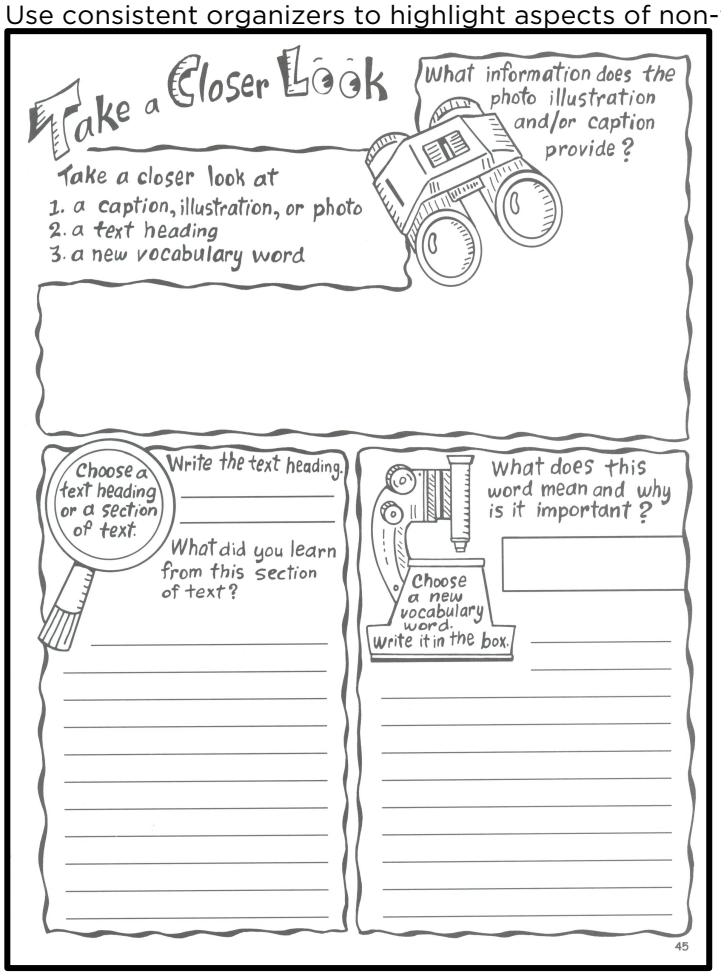
CCSS.ELA-Literacy.RST.6-8.10 By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently

General Suggestions:

- ✓ Identify various text features and explain the purpose of each feature. Create this as a poster to be used for future reference.
- ✓ Cover titles and subtitles to help students predict and check the purpose of each section
- ✓ Use highlighters, visual screens and other aids to focus on vocabulary
- ✓ Use graphic organizers to identify relevant details and formulate main ideas

Additional Strategies:

Use consistent organizers to highlight aspects of non-fiction text



Scholastic

NAME: _____ DATE: _____

SCIENCE: Box, bullets, and summary in my own words Textbook Page: _____

BIG IDEA
The main idea of this section is:

DETAIL #1	DETAIL #2	DETAIL #3	DETAIL #4

SUMMARY OF SECTION (in my own words)
This section is mostly about…

Frangos & Kroun

Who?

What?

Why?

Where?

When?

How?

Non-Fiction

Title: _____

Author: _____

Illustrator: _____

Copyright date: _____

Number of pages: _____

Name: _____

Date: _____

Topic, Person or Subject

Summary

Rate how difficult

1 2 3 4 5

Due to impairments in:

Students with ASD may struggle with:

Writing a lab report

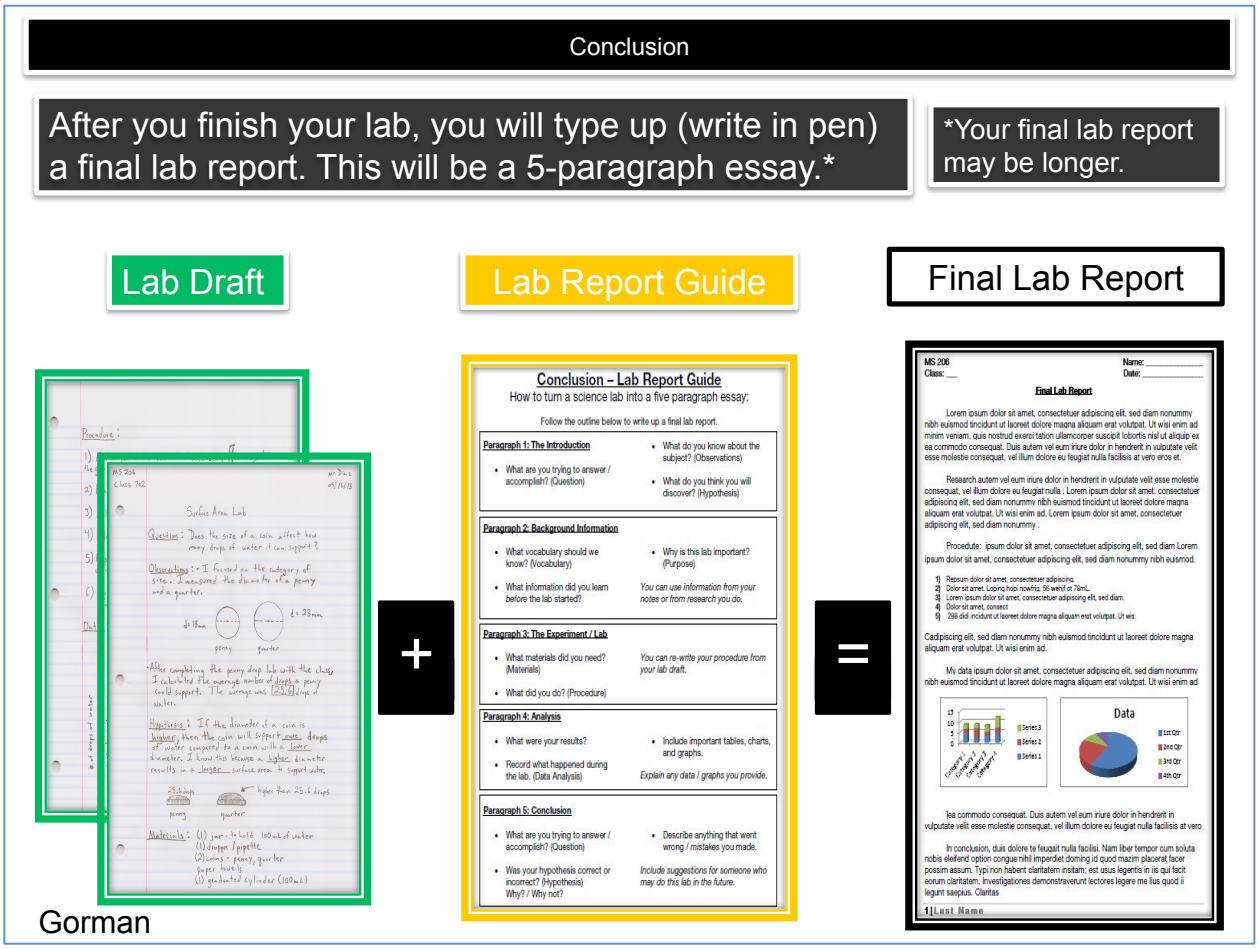
CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table)

General Suggestions:

- ✓ Use a checklist to include all elements of the lab in the essay in order to help with organization and sentence formation
- ✓ Use a graphic organizer to plan and compile data to then create an essay describing the experiment and results

Additional Strategies:

Provide scaffolds for the process of writing a lab report: from draft to template to the final



Name:_____ Date:_____

Section:_____

Lab Title

Safety Precautions:

Question / Objective: _____

Procedure (written in your own words):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Data/Results:

	Quantitative Data	Qualitative Observations
Trial / Substance 1		
Trial / Substance 2		

Group Discussion: What were your results and why/how did they occur?
Discuss with your lab partner/group and take notes below.

Lab Report Conclusion: Organizing and presenting data
Conclusion includes detailed descriptions for all observable properties for all qualitative observations and data from all quantitative results.

Vasquez/Gorman/Brown

How to Turn a Science Lab Into a Five-paragraph Essay

Follow the outline below to include everything you need in this essay which will explain a lab you have performed:

Paragraph 1: The Introduction

- What are you trying to answer/accomplish? **(purpose)**
- What subject/material are you studying?
- What do you think you will find? **(hypothesis)**

Thesis Statement: I am trying to _____
by _____ in order to _____

Paragraph 2: Background Information

- What vocabulary should we know? **(define)**
- Notes/information that you have learned *before* the lab
- Why is this lab important?

Lead in: In order to _____ I have conducted an experiment to _____

Paragraph 3: The Experiment/Lab

- What materials did you need? (materials)
- What did you do? (procedure)

Lead in: The data from the lab, including observations, was collected, analyzed and is presented below.

Paragraph 4: Analysis

- What happened in the experiment?
- Anything that happened during the lab **(observations)**
- Explain any data/tables/graphs you have made

Lead in: The results of the experiment helped _____ my hypothesis that _____

Paragraph 5: Conclusion

- What are you trying to answer/accomplish? **(purpose)**
  - **Yes, write it AGAIN!**
- Was your hypothesis correct or incorrect? **(hypothesis)**
  - Why?
- Describe anything that went wrong/*mistakes* you made
- Include *suggestions* for someone who may do this lab

Last Sentence: In conclusion, my investigation of _____ showed _____.

Lab Report Checklist

Lab Objective: _____

I. **Purpose**

___ - Question proposed for the lab is clear and descriptive.

___ - Written (or drawn) observations are present and relative to the lab

___ - A hypothesis is correctly stated [If…then….because]

___ - Variables are clearly listed and detailed

___ - Constants and/or control groups are clearly listed and detailed

II. **Materials**

___ - *All* materials are clearly listed, including number of each material needed

III. **Procedure**

___ - Lab procedure is clearly written so that the experiment may be repeated by a reader

___ - Each step of the procedure is in the correct order [with no steps added or left out]

___ - Each step of the procedure is numbered and/or organized neatly

IV. **Data Tables and Graphs**

___ - *All* data collected throughout the lab is presented in this section

___ - Tables and graphs are correctly titled and have units and values

___ - All graphs have a correctly labeled x-axis and y-axis

V. **Conclusion**

___ - The **hypothesis is revisited**, and is either supported or refuted

___ - An explanation of "if the lab worked" is provided (using data gathered in section IV)

___ - Factors as to why **or why not the lab was successful** are provided

___ - Any mistakes, errors or unforeseen obstacles are listed for record keeping

___ - Suggestions to improve the lab for future scientists are presented based on data

VI. **Overall Completion**

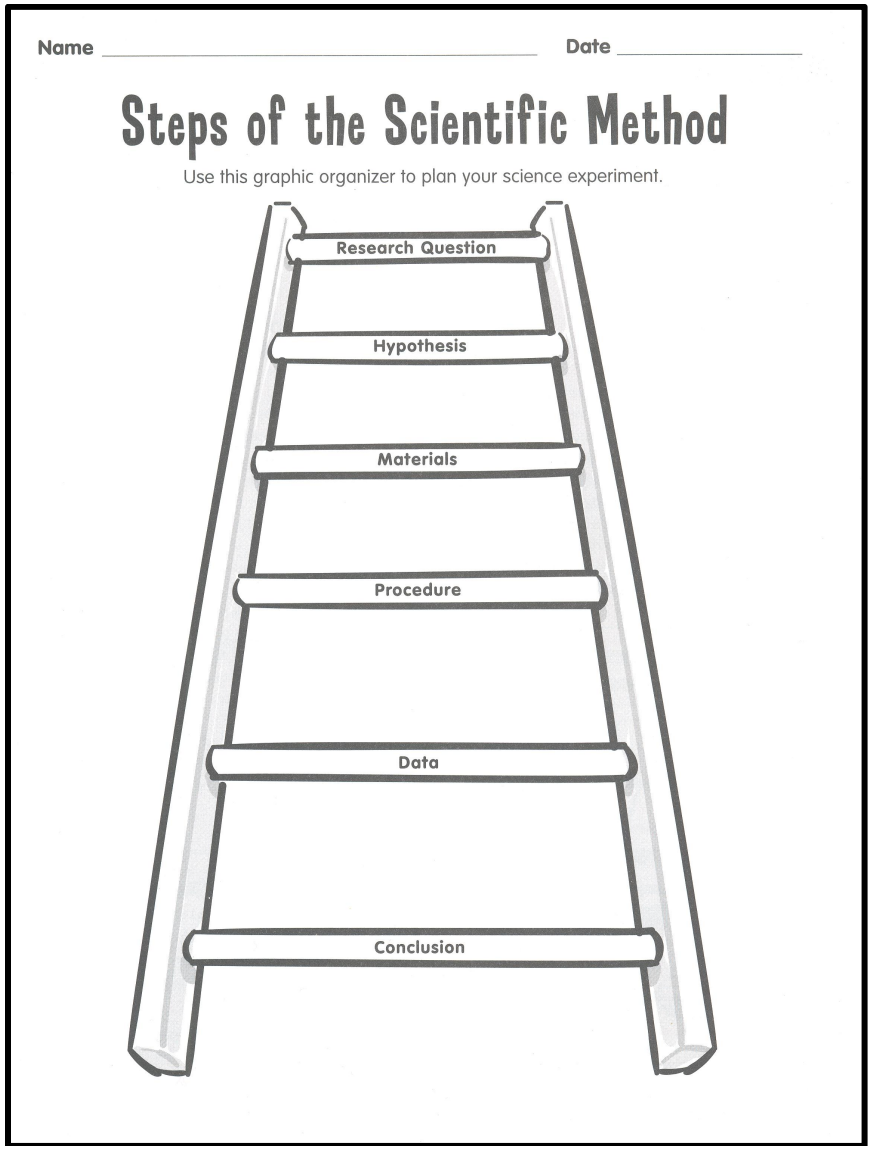
___ - There are few or no spelling errors found throughout the lab

___ - Tables and graphs are neatly organized as to make the data clear to the reader

___ - Each section of the lab is clearly labeled and easy to follow

Gorman

Use a consistent visual to break down the components of the scientific method, and elements of a lab report



Scholastic

Due to challenges in:

Students with ASD may struggle with:

Vocabulary

CCSS.ELA-Literacy.RST.6-8.10 By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently

General Suggestions:

- ✓ Teach vocabulary in context, emphasizing the relationship to the big picture and application to content
- ✓ Teach a consistent structure for students to record and refer to content vocabulary
- ✓ Highlight vocabulary as it is used through various activities, lessons, texts etc.
- ✓ Teach categories and frameworks that vocabulary is associated with to encourage accurate application of the terms
- ✓ "Apply Your Knowledge": Have students select an option (create a vocabulary book with words, definitions and examples; create a comic strip using vocabulary words; create a short story using vocabulary in context)

Additional Strategies:

Use a "words of the week" organizer – example here with summary at bottom

Name _____ Class _____

Words of the Week – Due April 25, 2014

Vocabulary Term	**Definition**
Cellular Respiration	
ATP	
Photosynthesis	

In your own words explain how two body systems help us get energy to our cells

_____
_____
_____

In your own words explain how plants use cellular respiration and photosynthesis to help them make energy

_____
_____
_____

Vasquez/Sasson

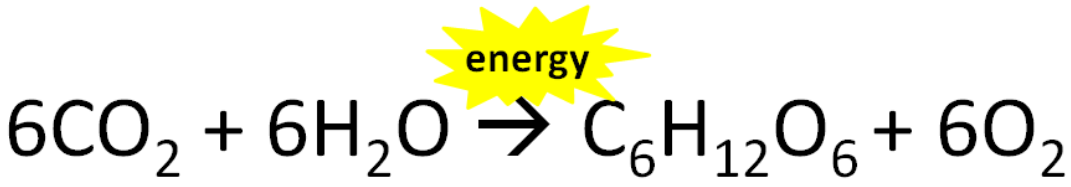
A “words of the week” organizer example with example/formula

Name _____ Class _____

Words of the Week – Due April 25, 2014

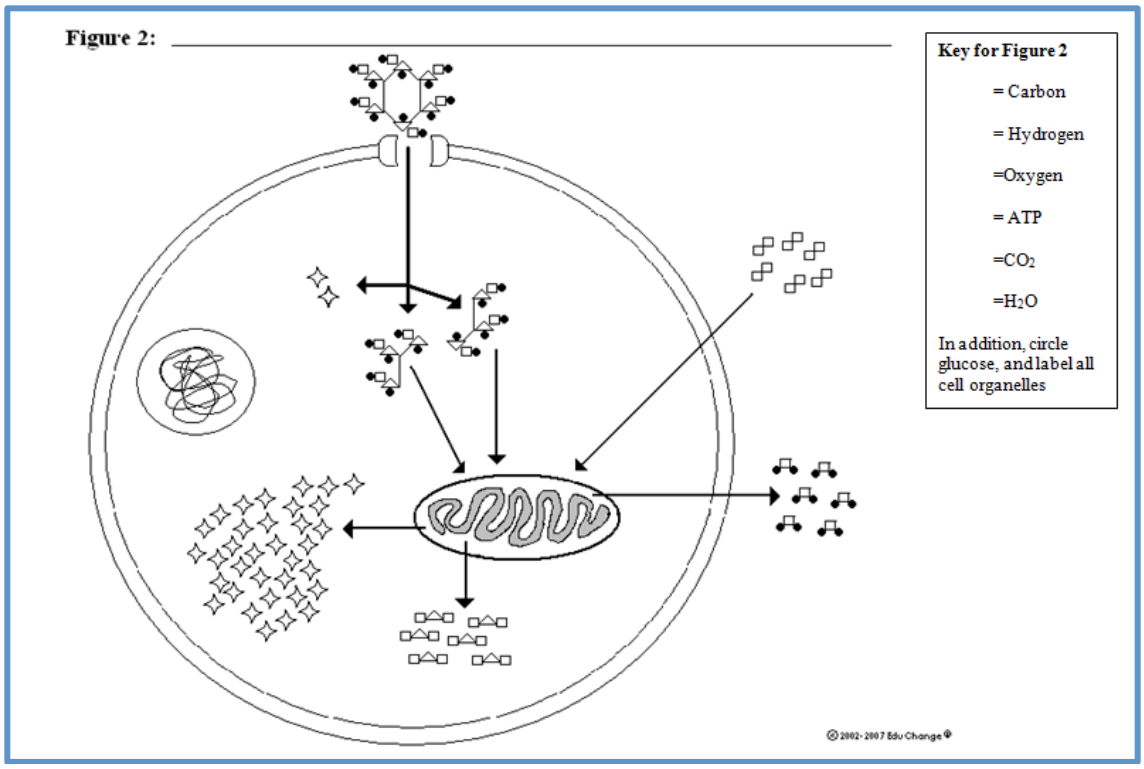
Vocabulary Term	Definition
Equation	
Reactants	
Products	
Subscript	
Coefficient	
Reaction	
Carbon – Oxygen cycle	
Photosynthesis	
Respiration	
Combustion	
Decomposition	

Label all parts of the equation below **as we are doing it in class**

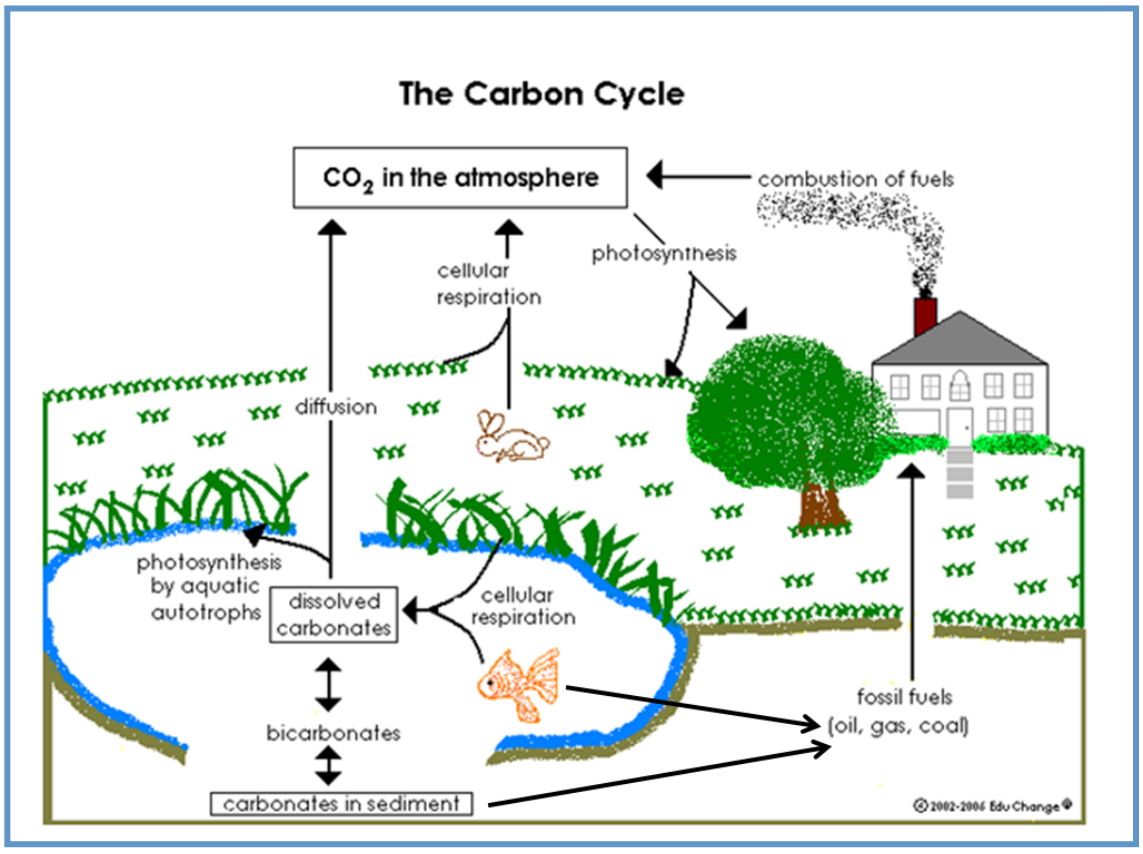


Vasquez/Sasson

Use clear visuals to label diagrams



EduChange



EduChange

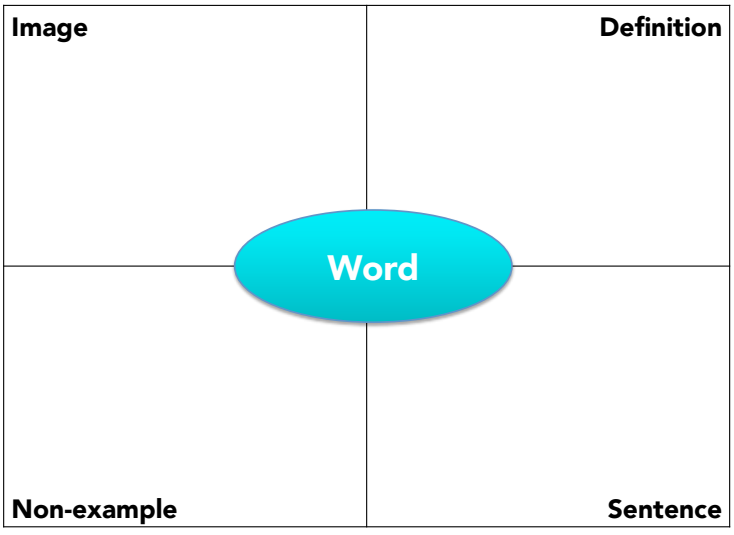
Create and practice consistent structures to aid in note-taking

Vocabulary Procedure:

- We are going to have a LOT of vocabulary words this year…so let's make it easy to find them!
- Draw a BOX around each vocabulary word as we write them in our notebooks to that it'll be easier to find!
- Title the first page "**Scientific Method**"
  - We will organize our vocabulary by unit
  - You can check the Word Wall for the vocabulary for each unit

Gorman

Use graphic organizers to explore new vocabulary concepts



Brown & Gorman

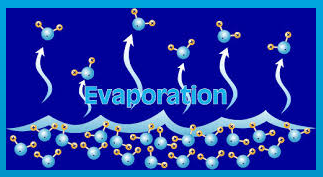
Create a “living word wall”

Living Word Wall

- Select a content word or concept to highlight in your activity or lesson
- Create a document providing the definition and/or image
- Wear it as a sign (teacher word wall) through out the period.

Evaporate

When a liquid changes into a gas. Energy is added causing the atoms to spread apart.



Brown & Gorman
Adapted from Paula Kluth

Due to challenges in:

Students with ASD may struggle with:

Creating models:

- Combining information from multiple sources
- Thinking abstractly (use of materials)

CCSS.ELA-Literacy.RST.6-8.7 Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table)

General Suggestions:

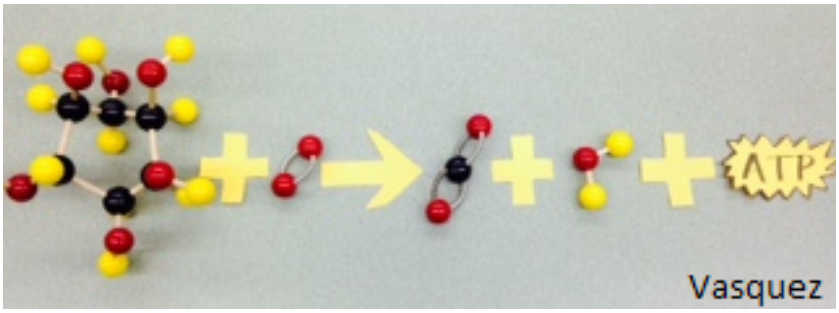
- ✓ Provide direct instruction to discuss how materials can be used for multiple purposes (e.g. candy to be used for a model [see below])
- ✓ Differentiate between models and the 'real thing' – models are a representation and often not to scale
- ✓ Give students multiple examples of models to view, and then brainstorm new ways to represent the concept/information.
- ✓ Provide a task analysis or checklist to guide organization and brainstorming.

Additional Strategies:

Provide a consistent organizer to break down what materials are used to represent

Cell Part (organelle)	Candy (material)	Function (what does it do?)
Nucleus	Cookie	Controls the cell

Utilize a variety of materials to create physical models



GUIDED NOTES

If requiring students to take notes, it may be useful to use **GUIDED NOTES**, a visual note-taking support. They provide structure to a note-taking sheet, as well as reduce the amount of writing required. There is research to support that the use of guided notes makes students' notes more organized, allows them to focus more on the content, and can improve performance on tests and quizzes.

For students in the Nest program, there are added benefits. With regular use of **GUIDED NOTES**, students can:
- engage more directly with the content, without being distracted by writing demands
- follow the flow of classroom activities, due to the predictability of the structure
- participate more in classroom discussions, with support of this visual, concrete aid

Creating GUIDED NOTES

Based on your mini-lesson outline, or PowerPoint/SMARTBoard lesson:
1. Create a copy of your outline (or copy & paste your PPT/SB presentation content into a Word document)
2. Substitute key words and phrases with blank lines (with sufficient space for students to hand-write the words)
   - *select words that are important for your students to write: main ideas, vocabulary, ideas to remember*
3. Incorporate symbols, visuals, and graphic organizers (see below)
4. Distribute the guided notes sheet before a lesson, and use the outline to follow the flow of the lesson

symbols	visuals	graphic organizers
use consistent symbols to indicate main ideas, key points, etc.	include diagrams, maps, and pictures for students to refer to and label	incorporate simple webs, cause and effect diagrams, and other organizers to reinforce connections between ideas

Sample Guided Notes Sheet: Science

The Layers of the Atmosphere

There are ☐ layers of the atmosphere. *

The _____ is the layer closest to the earth.
• where _____ & _____ live

The _____ is where the ozone layer is located.
• where _____ fly

The _____ is the coldest layer.
• where meteors _____

The _____ is where shuttles orbit the earth.
• where temperature is _____

The _____ is the layer farthest from the earth.
• where air is the _____

important qualities of layers of the atmosphere *

☐ ☐ ☐ ☐

* = key idea

____sphere
____sphere
____sphere
____sphere
____sphere
earth

Sample Guided Notes Sheet: Science *completed*

The Layers of the Atmosphere

There are **5** layers of the atmosphere.*

The **troposphere** is the layer closest to the earth.
• where plants an animals live

The **stratosphere** is where the ozone layer is located.
• where jets fly

The **mesosphere** is the coldest layer.
• where meteors burn up

The **thermosphere** is where shuttles orbit the earth.
• where temperature is highest

The **exosphere** is the layer farthest from the earth.
• where air is the thinnest

important qualities of layers of the atmosphere *

distance from earth | temperature | distance from earth | air quality

* = key idea

exosphere
thermosphere
mesosphere
stratosphere
troposphere
earth

Implementation

- Introduce guided notes to the entire class, so as not to stigmatize individual students
- Teach directly into taking notes using guided notes sheets – allow for practice
- Create and instruct students about a structure for organizing/tracking guided notes sheets (binders, folders)
- Instruct students how to use guided notes sheets as reference for homework, to review for quizzes, etc.

Other considerations

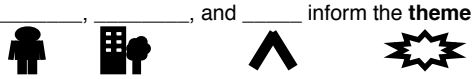
- Differentiate by varying the amount of writing required
- Include space designated for extra thoughts, reactions, questions
- Align with Depth of Knowledge levels (apply a concept, synthesize information from multiple sources)

Sample Guided Notes Sheet: ELA

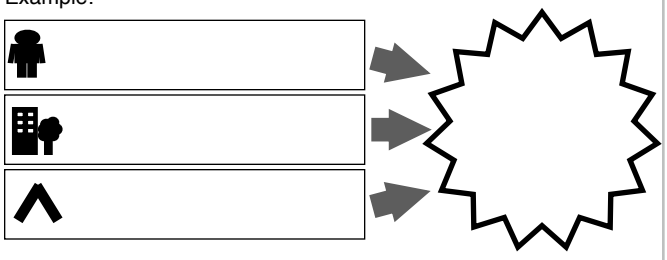
Connecting **Theme** to Story Elements

Theme is the _____ of a story
It can be stated in ____-__-____ words.
Examples: _____, _____, _____

_____, _____, and _____ inform the **theme**



Example:



Summary Sentence

The theme of the story _____ is _____.
The characters () _____.
The setting () _____.
The plot () _____.
This is all evidence show the theme () _____.

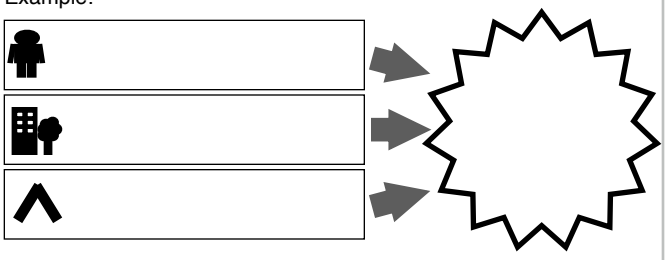
Sample Guided Notes Sheet: ELA *completed*

Connecting **Theme** to Story Elements

Theme is the subject of the message of a story
It can be stated in one-to-two words.
Examples: perseverance, growing up, overcoming obstacles

Characters, setting, and plot inform the **theme**

Example:



Summary Sentence

The theme of the story _____ is _____.
The characters () _____.
The setting () _____.
The plot () _____.
This is all evidence show the theme () _____.

Additional Resources

- **Guided Notes: Improving the Effectiveness of Your Lectures**: http://ada.osu.edu/resources/fastfacts/Guided-Notes-Fact-Sheet.pdf (or google ***guided notes fact sheet***)
- **Guided Notes: Increasing Student Engagement During Lecture and Assigned Readings** (Intervention Central): http://www.interventioncentral.org/academic-interventions/study-organization/guided-notes-increasing-student-engagement-during-lecture- (or google ***intervention central guided notes***)
- **Preparing Guided Notes: A guided system of learning within lecture** (Study Guides and Strategies): http://www.studygs.net/teaching/guidednotesa.htm (or google ***preparing guided notes***)

CORNELL NOTES

The **Cornell method** of note-taking provides a systematic format for writing concise, organized notes. Students divide their paper into two columns:

- the note-taking column on the right
- the questions/key word column on the left

They then leave five to seven lines—or about two inches—at the bottom of the page

Students write notes from a class (or a text book) in the note-taking column. Notes should consist of the important ideas and concepts from the text or lecture, and long ideas are paraphrased. Teachers teach students to avoid long sentences and to use symbols or abbreviations instead.

To assist with future reviews, relevant questions or key words are written in the key word column on the left, after the lecture or reading.

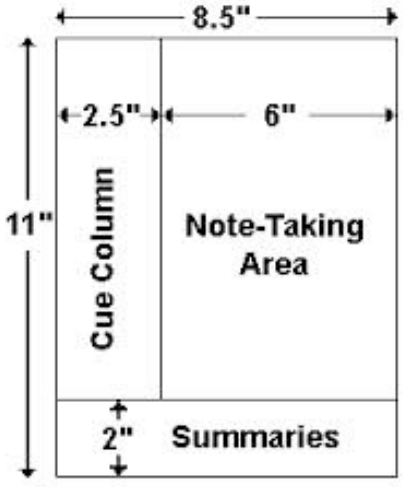
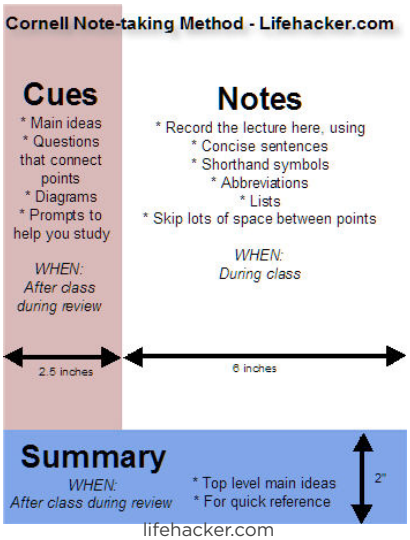
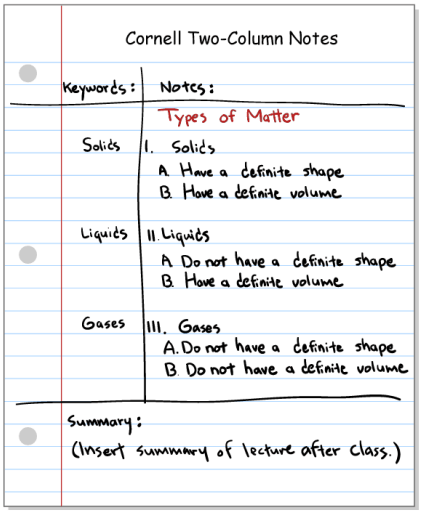
Within 24 hours of taking the notes, students review their notes and write main ideas and questions in the left column. Then, they write a brief summary in the bottom five to seven lines of the page. This helps to increase understanding of the topic. When studying for a test or quiz, students have a concise but detailed and relevant record of previous classes.

When reviewing the material, students can cover the note-taking (right) column while attempting to answer the questions/keywords in the key word or cue (left) column. Students are encouraged to reflect on the material and review the notes regularly.

Adapted from wikipedia.com

Examples

The images below show examples of how to set up Cornell Notes on a page, what each section is used for, and an example of what a completed notes sheet may look like.

Setting up Cornell Notes	Description of sections	Example
		
www.montgomerycollege.edu	lifehacker.com	fontanamiddleschool.wikispaces.com

Below is a larger example of a completed sheet of Cornell Notes, including how you may want to set up the heading for the page.

Topic: Cornell Notes

Subject: ELA **Date:** September 9, 2014

Main Ideas	Details
Uses for Cornell Notes	• Organized by main ideas and details • Can be used to provide an outline of the course, chapter, or lecture • Can be used to provide a "big picture" of the course, chapter, or lecture • Sequential: students take notes as they are given by the teacher or in a text book • At the end of class, students write a summary of what they learned to clarify and reinforce learning and to assist retention (or assign for homework)
Benefits of Cornell Notes	• Can be used as a study tool: students get a quick overview and determine whether they need more information or need to concentrate their studying on specific topics • Creating a consistent structure is beneficial to students on the spectrum who thrive with predictability
Other types of note-taking	• Can be combined with other types of note-taking, such as guided notes: provide a Cornell Notes template
Summary: Cornell notes help students organize notes into main ideas and details. They are helpful for students on the spectrum and can be used as a study guide. They can be used in conjunction with guided notes.	

Adapted from Bucks County Community College: http://faculty.bucks.edu/specpop/Cornl-ex.htm

Additional Resources

- **Cornell Notes**: http://en.wikipedia.org/wiki/Cornell_note-taking_system (or google ***guided notes wikipedia***)
- **Note Taking: Cornell Method:** http://www.usu.edu/arc/idea_sheets/pdf/note_taking_cornell.pdf (or google ***usu cornell method***)

Nine Types of Curriculum Adaptations

PARTICIPATION
Adapt the extent to which a learner is actively involved in the task

Examples:
- Thumbs up/thumbs down response
- Cue cards: clothes pins on paint chips
- Small group work with roles

QUANTITY
Adapt the number of items that the learner is expected to learn or number of activities student will complete prior to assessment for mastery

Examples:
- Reduce number of problems/body paragraphs/direct quotes required
- Shorten homework requirement
- Use checklists on which 3 out of 5 parts must be completed

TIME
Adapt the time allotted and allowed for learning, task completion, or testing

Examples:
- Increase amount of time given
- Allow to complete task at home
- Provide additional instruction time at recess, study hall, etc.

INPUT
Adapt the way instruction is delivered to student

Examples:
- Vary whole-class/small group, mini-lesson/discovery, oral/reading, etc.
- Include multimedia: video, audio, photographs, illustration
- Use manipulatives, hands-on materials

OUTPUT
Adapt how the student can respond to instruction

Examples:
- Allow options for work/assessments:
  - written
  - poster
  - oral presentation
  - technology

DIFFICULTY
Adapt the skill level, problem type, or the rules on how the learner may approach the work

Examples:
- All differentiated instruction
- Modify reading levels
- Modify tasks

LEVELS OF SUPPORT
Increase the amount of assistance to keep the student on task or to reinforce or prompt use of specific skills. Enhance adult-student relationship; use physical space and environmental structure.

Examples:
- Provide ask analysis/checklists
- Use guided notes & graphic organizers
- Provide small group and individual support

ALTERNATE GOAL
Adapt the goals or outcome expectations while using the same materials

When routinely utilized, this is only for students with moderate to severe disabilities

SUBSTITUTE CURRICULUM
Provide different instruction and materials to meet a learner's individual goals

When routinely utilized, this is only for students with moderate to severe disabilities

From Diana Browning Wright, 2005, altered with permission from Jeff Sprague, Ph.D. from an original by DeSchenes, C., Ebeling, D., & Sprague, J. (1994). Adapting Curriculum & Instruction in Inclusive Classrooms: A Teachers Desk Reference. ISDD- CSCI Publication.
Icons: Aaron Lanou, 2012