

Cognitively-Based Assessment of Writing

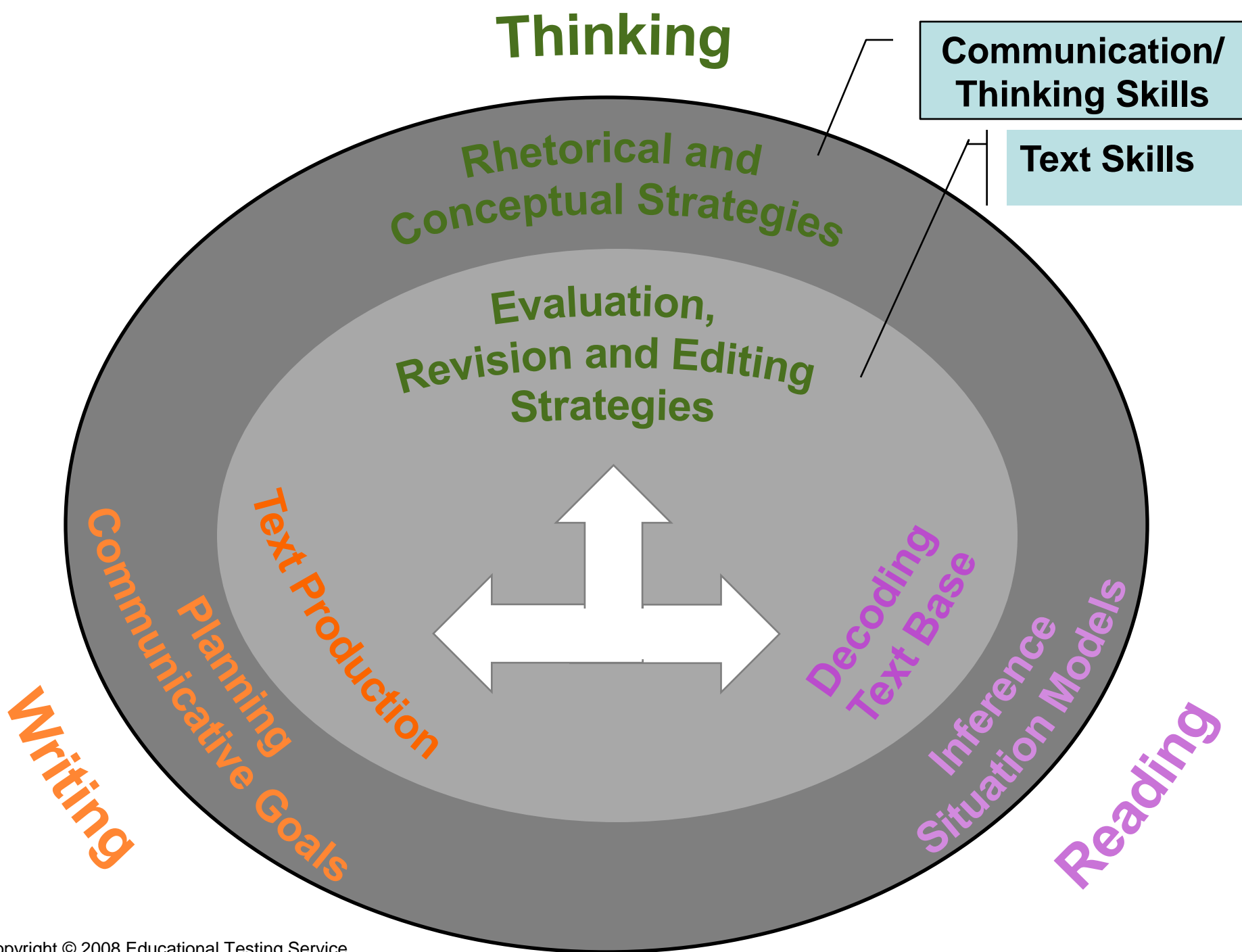
Concepts and Applications

March 3, 2010

**Paul Deane and Mary Fowles
Educational Testing Service**

First Steps: A Simple Literacy Model

- Text Skills vs. Communication Skills
- Interaction among
 - Thinking
 - Reading (and listening)
 - Writing (and speaking)



A Major Theme

Meaningful writing

- cannot be isolated from related literacy skills
- typically involves working with other texts
- requires real thought

Reading, Writing and Thinking Go Together

- Individual skills are meaningless in isolation
- Expertise involves
 - Fluency of component skills
 - Rapid switching and multitasking
 - Strategic control

Learning to write is learning how to coordinate literacy skills effectively to produce written texts.

Implications

- A writing test has to do more than assess text production
- Measurement of component skills is not enough
- Expert writers know how to coordinate writing, reading, and thinking processes during writing

Novice and Expert Writers

- Novice Writers: ‘Knowledge Telling’
 - Emphasis on text production
 - Minimal strategic switching among literacy tasks
- Expert Writers: ‘Knowledge Transforming’
 - Emphasis on communication
 - Strategic control of literacy processes to produce quality text

A More Detailed View

- **Three Basic Modes of Thought**

- Interpretation (reading and listening)
- Expression (writing and speaking)
- Reflection/Deliberation (thinking)

- **Five Types of Cognitive Representation**

Communication Skills

Social

Conceptual

Print Skills

Textual

Verbal

Lexical/Orthographic

A Cross-Section: Types of Activities

Reflection/Deliberation

Collaborate

Rethink

Revise

Edit

Proofread

Orthographic

Verbal

Textual

Conceptual

Social

Inscribe

Phrase

Structure

Inquire

Engage

Expression

Decode

Understand

Integrate

Infer

Empathize

Interpretation

Implications of the Model

- At any point, a skilled writer may be engaging in several of these activities, simultaneously or in rapid succession
- There are many ways to fail, and many ways to succeed
- Different situations and purposes require different combinations of skills
- Thus instruction should build up, and assessment should measure, this variety of skills

A Different Cross-Section: Skills Integrated Across Activities

Communication and Thinking Skills

Social

Intentionality

(Genre, Role, and Purpose)

Perspective

(Point of View, Bias, Voice)

Affect

(Stance and Tone)

Conceptual

Presentation

(Review, Reflection, Description)

Explanation

(Generalization, Definition, Analysis)

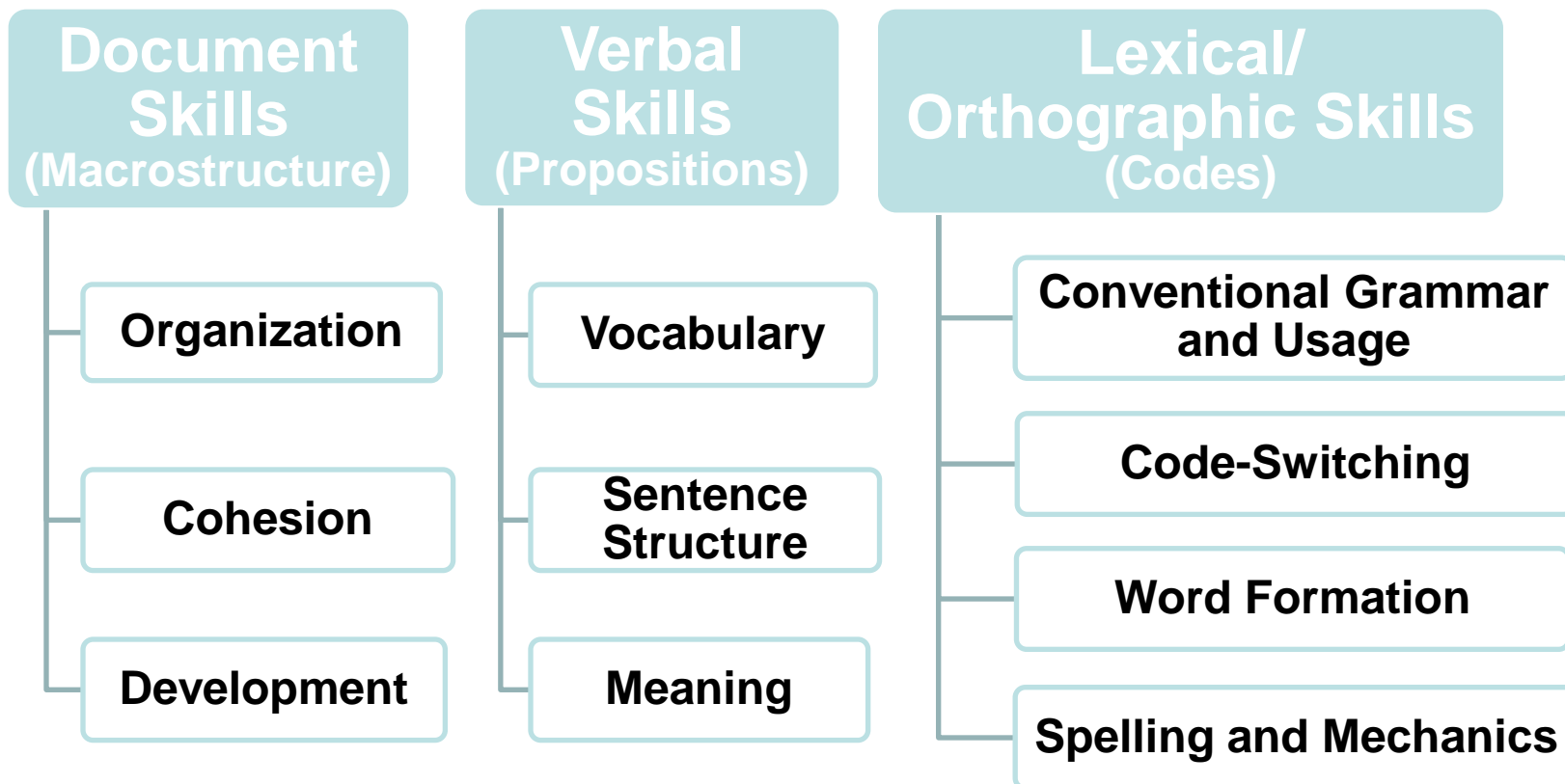
Modeling

(Synthesis, Application, Hypothesis-Formation, Experimentation)

Judgment

(Evaluation, Justification, Criticism)

Text Skills



Putting the Pieces Together

Genres as Ways to 'Package' Writing Skill

- Context and communicative purpose mobilize specific literacy sub-skills
- Can be learned by example
- Draw upon specific social, conceptual, textual strategies

Mapping out Rhetorical and Conceptual Requirements by Genre

- Each genre has a characteristic purpose
 - driven by the writer's role in the larger social context
 - including the perspective and attitudes of the audience
- Effective strategies for achieving this purpose
 - entail characteristic conceptual strategies for each genre
 - and favor characteristic organizational patterns, styles and accompanying text features

An Example: The Persuasive (Argumentative) Essay

- **Social: Role of advocate**
 - **Purpose:** convince audience that a claim is true
 - **Expectations:** taking a stand, logical arguments, assumptions of rationality and reasonableness
- **Conceptual: Use argument-building strategies**
 - Advance a claim that is clear and defensible
 - Produce valid and convincing reasons to believe the claim
 - Back up those reasons with accurate and relevant evidence
 - Focus audience on convincing reasons while addressing counterarguments
- **Textual: Expository essay structure**
- **Verbal: Formal style**
- **Lexical/Orthographic: Standard English conventions**

Typical Purposes

- Report
- Explain
- Convince
- Propose
- Recommend
-

Families of Conceptual Strategies

Presentation	Explanation	Modeling	Judgment
Means/End Planning	Contingency Modeling	Heuristics	Standard-Setting
Self-Explanation	Social Simulation/ Role-playing	Reconciliation of Perspectives	Appeal-Building
Guiding Questions	Close Questioning	Close Reading	
Outlining	Concept Mapping	Hypothesis Testing	Argument Building
Defining			

Some Examples of Genres as Ways to 'Package' Communicative Purposes with Effective Supporting Strategies

Persuasive Meta-Genres

Strategy	Meta-Genre
Appeal-Building	Promotion — persuasion focused on action and emotional appeal Recommendation — evaluation of choices; persuasion focused on alternatives
Standard-Setting	Apology — defense of rightness of actions Exemplum — story implicitly presenting actions as model to emulate or avoid
Argument-Building	Discussion — consider multiple positions and arguments without taking a side Persuasive Essay — advance specific thesis and logically defend it with evidence Critique — evaluation of the arguments advanced in a text Rebuttal — text examining arguments of others and presenting reasons to reject them

Expository Meta-Genres

Strategy	Meta-Genre
Self-Explanation	Note taking — self-explanation as an aid to memory Description — concrete presentation of things one knows
Guiding Questions	Report — systematic presentation answering key questions Explication — systematic explanation of the information presented in a text, intended to clarify and expand on key information
Outlining	Summary — key ideas and organizing information from a text re-presented in own words Survey — text combining information from multiple sources to create coherent picture
Defining	Gloss — annotations defining key ideas or terms Comparison/Contrast — defining ideas, identifying shared and unique attributes
Hypothesis-Testing	Theoretical account — presenting model and fitting it to range of facts/observations Experimental report — presenting data organized to evaluate how well it fits a model

Narrative and Literary Meta-Genres

Strategy	Meta-Genre
Social Simulation/ Roleplay	<p>Narration — presentation of a story with full attention to purpose, motivations, point of view and other aspects of the social model for the events described</p> <p>Synopsis — summary of a story</p> <p>Commentary — explanation elaborating on story elements and their significance</p> <p>Interpretive account — analysis of story that presents and justifies interpretations of characters, motivations, and other social elements (also involves beginnings of close reading)</p>
Reconciliation of Perspectives	<p>Historical Account — analysis combining information from multiple sources to describe historical events and their causes</p>
Close Reading	<p>Literary analysis — interpretation attending in detail to how literary effects are produced and integrating information drawn from literary context</p>

Pragmatic Meta-Genres

Strategy	Meta-Genre
Means-End Planning	Procedure — directions how to perform an action Problem statement — broad descriptions of a task to be accomplished
Contingency Modeling	Method — directive text that explains reasons as well as procedures Proposal — text proposing specific plan detailing how goals will be accomplished
Heuristics	Case Study — presents specific case as illustration of principles Manual — synthesizing multiple procedures into systematic account

Designing Summative Assessments to Cover the Universe of Discourse

Summative Assessments

- Are defined relative to genres
- Focus on ***genres to be learned***
 - I.e., in zone of proximal development
 - Illustrate range of purposes for writing
 - Require a variety of critical thinking strategies
- Presuppose simpler **prerequisite genres**

(for instance, summary is prerequisite to persuasive essay)
- Model appropriate strategies for each genre

Selection Principles

- There are **many** models for ‘good writing’
- A pool of designs will cover a range of genres and types of critical thinking
- The selection of designs is flexible depending on curricular requirements
- Many different instructional models supported, including language-arts focus and writing across the curriculum

Four Middle School Genres

Genre of Writing	Critical Thinking Strategies Being Developed	Task Sequence
Letter/Memorandum (Recommendation)	<ul style="list-style-type: none">• Appeal-Building• Standard-Setting	Develop a recommendation that uses guidelines to support a choice
Pamphlet (Survey)	<ul style="list-style-type: none">• Guiding Questions• Outlining	Research a topic and report the results
Literary Essay (Interpretive Account)	<ul style="list-style-type: none">• Social Simulation/ Role-Play• Close Reading	Read and Interpret Literary Works
Persuasive Essay	<ul style="list-style-type: none">• Argument Building	Develop and justify one's position on an issue, considering arguments pro and con

Designing Summative and Formative Assessments

Assessment Goals

- Measure both **communication/thinking** and **text** skills, with a focus on their use in writing
- Measure prerequisite **reading** and **thinking** skills students must have to apply expert writing strategies
- Use the pattern of results to suggest hypotheses about why students are performing well or poorly

Instructional Goals

Summative Assessments should

- Model the genre and scaffold key learning progressions
- Provide teachers with actionable information on whether students have mastered prerequisite skills

Formative Assessments should

- Model and scaffold prerequisite skills
- Teach key writing strategies needed for expert performance in each genre

Our Current Design Strategy

Each Summative Assessment

- embodies a **scenario**, begins with a sequence of **lead-in tasks**, and culminates in a **sustained writing task**
- presents grade-appropriate texts for students to read and think about
- supports thinking and writing activities with supporting elements such as guidelines, tips for getting started, planning tools, etc.

The Scenario

- Gives students a sense of what they will need to do, and why
- Communicates the social expectations of the genre
- Provides a meaningful exemplar of how the genre might be used outside the assessment situation

The Lead-In Tasks

- Exemplify one or more **learning progressions** that support skills presupposed by the culminating task
- **Scaffold** the thinking processes needed to perform well on the culminating task
- **Provide measurement** for skills not easily measured in the culminating task (but necessary for that genre)
 - prerequisite reading skills
 - prerequisite critical thinking skills
 - proofreading, editing, revising skills
 - prerequisite writing genres such as summarization

The Culminating Task

Requires students to

- produce text in a **targeted genre**
- demonstrate genre-appropriate **communicative/thinking skills**, particularly their success in planning and achieving rhetorical purposes appropriate to the genre
- demonstrate fluency and accuracy in **text production** within the constraints of the genre

A Sample Writing Assessment

Should the U.S. Ban Advertising Aimed at Children?

Your local newspaper has been running a series of articles about whether or not the United States should [ban advertisements](#) intended for children under the age of twelve. Many people have become very interested in the issue, and several have written letters to the editor about it.

Your school has asked students to research this issue and then write essays expressing their own views. The best essays will be sent to the newspaper for possible publication.

For this project, you will perform four tasks:

Task 1: Read and Summarize Arguments

Task 2: Analyze Arguments

Task 3: Help Your Classmates Review a Letter to the Editor

Task 4: Present Your View in an Essay

Marketing

Summary Guide

Should We Ban **Marketing** to Children?

As parents, we want our kids to be able to tackle the choices they'll face as teenagers and adults. Some of those choices will have to do with marketing. If we think of childhood as the training ground for adulthood, then a ban on marketing to kids would rob them of the skills to become well-informed consumers. Instead, we parents can use advertising to give our kids the skills to cope in a commercial world.

Parents can make a point of watching television with their children and explaining commercials. When an ad comes on for cookies, for example, parents can discuss where cookies fit in the world of food. We can teach our kids how to read serving-size information and labels on foods. We can help kids understand such conditions as "assembly required" or "batteries not included" and help them buy items at a toy store or grocery store.

At or around age eight, children begin to understand that commercials include some form of **persuasive intent**. If they understand how marketing works, eight-year-olds will be able to understand how ads are trying to persuade them. If they see an ad for an item they want, children can save for it, sacrifice buying something else in order to pay for it, or choose to keep their money. Children then will understand choice and have the skills to deal with it. They will be on the road to becoming smart buyers.

Adapted from Margaret Hastings, "Should We Ban Marketing to Children?" *Today's Parent*, October 2006.

PART B – Read and Summarize An Article

Directions: Read "Should We Ban Marketing to Children?" and write a brief summary (2-3 sentences) of its main points. To review the teacher's guidelines, click on "Summary Guide."

In the space below, briefly summarize this article *in your own words*.

Directions: Read each statement and decide whether it gives a reason to ban or to allow ads intended for children. Click on the box under Ban or Allow to indicate your answer. If you change your mind, click on the other box.

Some Reasons People Give to Ban or Allow Advertisements Aimed at Children	<u>Ban</u>	<u>Allow</u>
Commercials are very easy to remember and very hard to put out of your mind, so an advertisement will get a lot of people to buy something, even if it is not good for them.		
Most healthy adults watched a lot of commercials when they were young.		
Most parents are careful about keeping their kids safe, and they usually don't worry about what advertisements their children watch.		
Junk food advertisers like advertising to children because children are very easy to convince and the habits they form will often last the rest of their life.		
When a child sees an advertisement and keeps asking the parents to buy an advertised product, the parents usually give in, no matter what the child is asking for.		
Most people ignore most of the advertisements they see.		
Children may not understand that advertisements are trying to make want to buy something.		
If an advertisement makes a child want a product, parents can use that as an opportunity to teach the child how to make smart choices.		
Parents don't usually take the time to check what their children are watching on TV, so they don't know what advertisements their children are seeing.		
Some of the people who argue in favor of ads for children work for the advertising industry.		

Directions

Argument #1

Argument #2

Argument #3

Argument #4

Argument #5

Argument #6

CLAIM: We should allow advertising to children because it is the parents' job to decide what kinds of advertisements their children can watch.

EVIDENCE: Ads are reaching children through new media (the Internet, for example) and even in schools: companies sponsor educational materials and put product ads in students' textbooks.

The evidence

- ☐ supports the claim
- ☐ weakens the claim
- ☐ is not relevant

Dear Editor **Worries** **Marketing** **Trying**

Dear Editor:

Advertising aimed at children under 12 should be allowed for several reasons.

First, one family in my neighborhood sits down and watches television together almost every evening. The whole family learns a lot, which shows that advertising for children is always a good thing because it brings families together.

Second, research shows that children can't remember commercials well anyway, so they can't be doing kids any harm.

Finally, the arguments against advertising aren't very effective. Some countries banned ads because kids thought the ads were funny, but that's not a good reason. Think about it: the advertising industry spends billions of dollars a year on ads for children. They wouldn't spend all that money if the ads weren't doing some good. Let's not hurt children by stopping a good thing.

If anyone doesn't like children's ads, the advertisers should just try to make them more interesting. The ads are allowed to be shown on TV, so they shouldn't be banned.

Task 3

Directions: Read the "Dear Editor" letter. Then write a note for your classmates in which you:

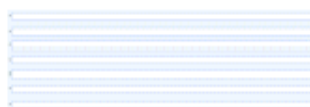
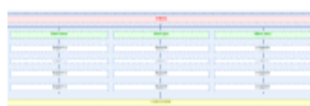
- Identify and explain problems in the letter's **reasoning** and
- Point out any information that is not **accurate**

Focus on just the most important problems.

Type your answer in the box below.

[Writer's Checklist](#)[Worries](#)[Marketing](#)[Trying](#)[Plan](#)**Choose a Planning Tool**

Click on a work plan below to open it up. When you finish making a plan, click on "Continue to Essay." The planning tool will copy what you have written directly into your essay.

List**Free Writing****Idea Tree****Idea Web****Outline**[Directions](#)[Your Answer](#)

Directions: Write an essay (3 to 5 paragraphs) for your local newspaper. Explain your view on the issue "Should the United States government ban advertising aimed at children?"

Type your answer in the box below.



Current Testing Assumptions

- Each Summative Assessment takes 90 minutes
 - 45 minutes for lead-in tasks
 - 45 minute for longer culminating task
- Mixture of selected-response and constructed- response items
- Scoring strategy
 - Automated scoring of text production skills
 - Combination of human essay score and automated scoring for communication skills

Learning Progressions and Formative Materials

Writing Learning Progressions

- Typically closely related to development of reading skills
- Summative assessments can only provide 'high level' picture
- More detailed learning progressions can be set up to support specific skills

An Example: Persuasive Essay Genre

- Prerequisite Genres
 - Summary
 - Position statement (~= thesis sentence)
- Primary Learning Progression: Argumentation
 - Take a position
 - Understand arguments for or against a position
 - Understand weight of evidence
 - Generate arguments
 - Evaluate and critique arguments

Sample Formative Materials

(To support formative assessment and
teacher professional development)

Here is a paragraph that can be summarized in one or two sentences. Highlight the parts of the paragraph that should be included in your summary. When you are finished, click "Next."

One of nature's great mysteries is how some birds and insects can travel long distances without losing their way, even when they are flying over water and have no landmarks to guide them. How can monarch butterflies, for example, **migrate** over 2,000 miles every fall from their homes in the United States and Canada to a special forest in Mexico where they've never been before—and then find their way back home in the spring? Or how can a flock of birds flying over the ocean get back on the right track after a storm has pushed them hundreds of miles off course? Some scientists now think that these birds, butterflies, and other migrating species have a **magnetic sense** that allows them to read our planet's magnetic field. This sense tells them where on (or above) Earth they are and what direction they are going.

Here is another way to highlight important information for a summary of this paragraph. How similar is it to yours? Compare them and then click "Next."

One of nature's great mysteries is how some birds and insects can travel long distances without losing their way, even when they are flying over water and have no landmarks to guide them. How can monarch butterflies, for example, migrate over 2,000 miles every fall from their homes in the United States and Canada to a special forest in Mexico where they've never been before—and then find their way back home in the spring? Or how can a flock of birds flying over the ocean get back on the right track after a storm has pushed them hundreds of miles off course? Some scientists now think that these birds, butterflies, and other migrating species have a magnetic sense that allows them to read our planet's magnetic field. This sense tells them where on (or above) Earth they are and what direction they are going.

One of nature's great mysteries is how **some birds and insects can travel long distances without losing their way, even when they are flying over water** and have no landmarks to guide them. How can monarch butterflies, for example, **migrate** over 2,000 miles every fall from their homes in the United States and Canada to a special forest in Mexico where they've never been before—and then find their way back home in the spring? Or how can a flock of birds flying over the ocean get back on the right track after a storm has pushed them hundreds of miles off course? Some scientists now think that these birds, butterflies, and other migrating species have a **magnetic sense** that allows them to read our planet's magnetic field. This sense **tells them where on (or above) Earth they are and what direction they are going.**

Read the summaries below that five different students have written for the paragraph. Use the drop-down menus to pick the best feedback comment for each one. If you change your mind, simply pick another comment. When you have made all your selections, click "Next."

I think it's really fascinating that birds and insects can use their magnetic sense to get to places that they've never seen before.	<div>Select...</div> <div>Select...</div> <div>Good summary!</div> <div>A summary should be briefer</div> <div>Don't just copy</div> <div>Don't give your opinion</div> <div>Needs main idea</div> <div>Select...</div>
Some scientists now think that migrating species have a magnetic sense that allows them to determine where on (or above) Earth they are and what direction they are traveling.	
Monarch butterflies can find a forest in Mexico that is over 2,000 miles from home, and birds flying over the ocean can get back on course after a storm knocks them hundreds of miles away.	
Migrating birds and insects might use a magnetic sense to go great distances, even over water, without getting lost.	<div>Select...</div>
People have wondered for a long time about how monarch butterflies can fly thousands of miles to Mexico every fall and then back every spring, or how birds can fly over the ocean and get pushed off their course by storms but still find their way. That's especially hard to do if you're flying over water, where everything looks the same. Why don't they get lost? Maybe scientists have come up with the answer. These birds and butterflies and other migrating species might be able to figure out where they are and where they should be going by using something called a "magnetic sense."	<div>Select...</div>

Pro and Con

The first step in examining an argument is to figure out which side of an issue the writer is on. There are always at least two sides to an issue:

- Pro (for)
- Con (against)

No matter which side a writer takes, he or she needs to provide reasons and evidence to support that position.

Here are two different positions on the subject of longer summer vacations:

- Longer summer vacations give students time to get really involved in summer projects.
- Longer summer vacations mean that students tend to forget much of what they learned last year in school.

ProCon

Click "Next" to continue.

Pro and Con

Some reasons and evidence might seem convincing at first because they are related to the topic, but they *don't actually support any position* on the issue. These statements are

- Neither Pro Nor Con

Some reasons and evidence may have *nothing* to do with the subject at all. These statements are considered

- Off Topic (about a totally different subject)

Here are two other statements:

- **Summer vacations are more popular in the northeast than in the southwest.**
- **This summer is cooler than it was last summer.**

Neither Pro Nor Con - it's on the general subject of summer vacations, but isn't about longer summer vacations.

It is Off Topic -- it's not on the subject of summer vacations at all.

Look at the following statements. Indicate whether each one

- supports a "pro" position on videogames
- supports a "con" position on videogames
- is neither pro nor con (refers to video games but does not help support a position) or
- is off topic (has nothing to do with videogames)

If you change your mind, just click on another choice.

Video Games Are a Good Form of Entertainment for Kids	Pro	Con	Neither Pro nor Con	Off Topic
Video games improve problem-solving skills.				
Video games can keep gamers from getting enough exercise.				
Previous generations did not have video games when they were growing up.				
Playing video games together is a good way to make friends.				
Students often neglect schoolwork in order to play video games.				
Television is also a popular form of entertainment.				
Gamers do not interact enough with other people.				
A psychology article reports that playing video games can help children learn better in school.				
Video games can have disturbing content that might cause violent behavior.				

Click "Next" to continue.

The Big Picture

- We have worked out a conceptual model based upon modern cognitive scientific theory
- We have worked out a design for the summative assessment intended to make them good models for instruction and educational experiences in their own right
- We are systematically developing supporting formative materials and teacher professional support
- We are actively pursuing a research program to validate and improve our designs