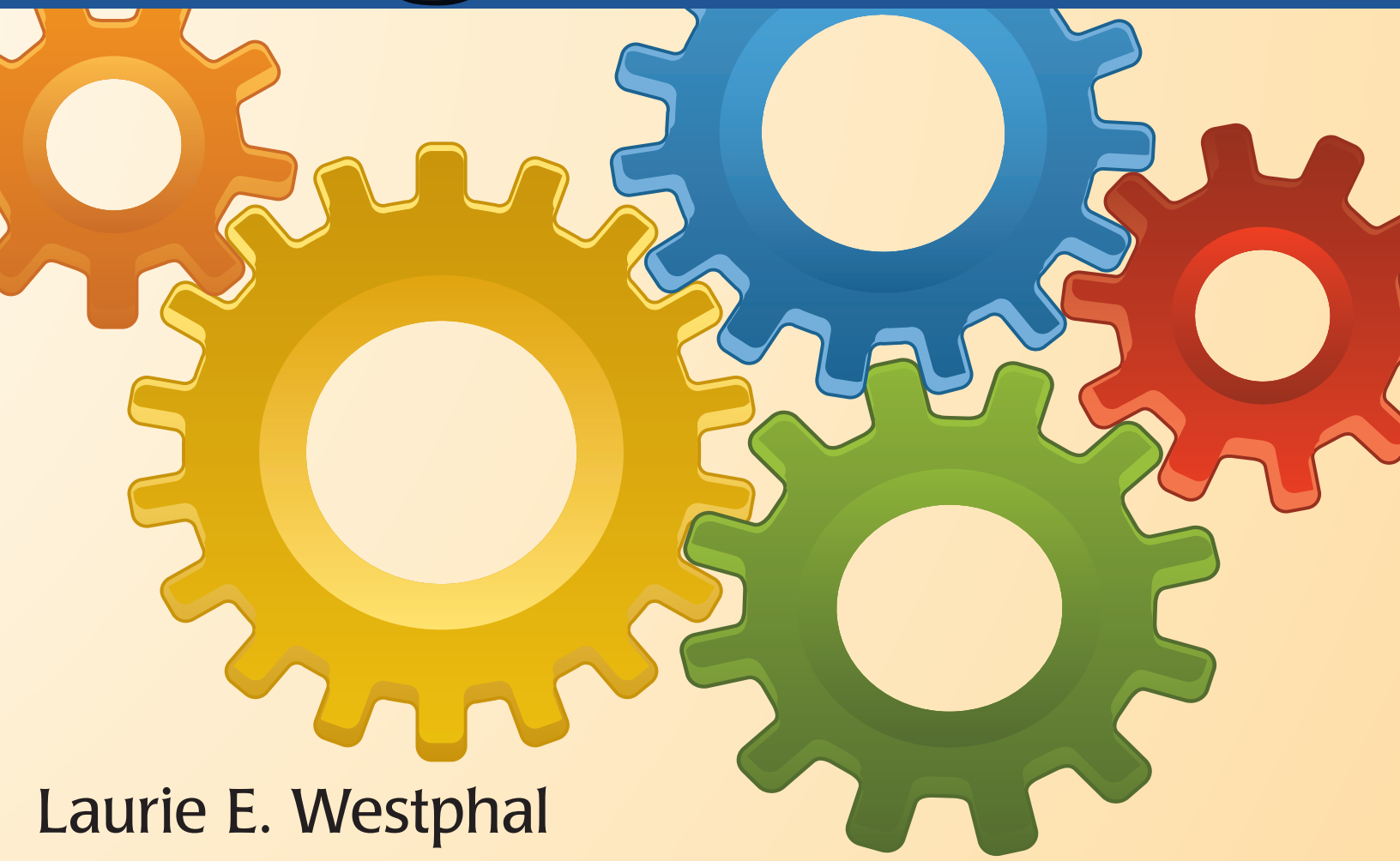
ADVANCED-LEVEL MENUS
GRADES 9–12

Differentiating Instruction With Menus

Algebra I/II



Laurie E. Westphal

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Algebra I/II

Laurie E. Westphal

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Chapter 1

Choice

"For so many reasons, it is the simply the right thing to do for this age group."

—Shared by a group of secondary teachers when asked why choice is important for students

Why Is Choice Important?

Ask adults whether they would prefer to choose what to do or be told what to do, and of course, they will say they would prefer to have a choice. Students—especially teenagers—have these same feelings. Although they may not always stand up and demand choices if none are present, they benefit in many ways from having them.

One benefit of choice is its ability to meet the needs of so many different students and their varied learning preferences. The Dunedin College of Education (Keen, 2001) conducted a study on the preferred learning styles of 250 gifted students. Students were asked to rank different learning options. Of the 13 different options described to the students, only

one did not receive at least one negative response, and that was choice. Although all students have different learning styles and preferences, choice is the one option that meets all students' needs. Why? Well, it takes the focus from the teacher as the decision maker and allows students to decide what is best for them. What teenager would argue against being able to do something that he or she prefers to do? Students are going to choose what best fits their learning preferences and educational needs.

> *"I really was not sure how my students were going to react to these choices. I didn't want the menu to be viewed as busy work when we already had so much content to cover. I was surprised (and relieved) by how well they responded [to the choices]. Now, they want to have choice in everything, which is always up for negotiation."*
>
> —English II teacher

Another benefit of choice is a greater sense of independence for the students. What a powerful feeling! Students will be designing and creating products based on what *they* envision, rather than what their teacher envisions. When students would enter my classroom, many times they had been trained by previous teachers to produce exactly what the teacher wanted, not what the students thought would be best. Teaching my students that what they envisioned could be correct (and wonderful) was often a struggle. "Is this what you want? and "Is this right?" were popular questions as we started the school year. As we progressed and I continued to redirect their question back to them ("Is that what you would like to show?" and "Does that seem right to you?"), students began to ask for my approval less; they became more independent in their work. They might still need assurance, but the phrasing becomes different: "This is what I have so far. Can I ask for help from Joe?" and "I really don't like this; I am going to pick something else." Allowing students to have choices in the products they create to show their learning helps encourage this type of independence in our students.

Strengthened student focus on the required content is a third benefit. When students have choices in the activities they wish to complete, they are more focused on the learning that leads to their chosen product. I know that getting teenagers excited about our content is sometimes a battle, but if the product (e.g., a play, a comic strip, a book) is seen as exciting or challenging, then the battle is half over. Students become

excited when they learn information that can help them develop a product they would like to create. Students pay close attention to instruction and have an immediate application for the knowledge being presented in class. Also, if students are focused, they are less likely to be off task during instruction.

Many a great educator has referred to the idea that the best learning takes place when the students have a desire to learn. Some students still have a desire to learn anything that is new to them, but many others do not want to learn anything unless it is of interest to them. By incorporating different activities from which to choose, students stretch beyond what they already know, and teachers create a void that needs to be filled. This void leads to a desire to learn.

A Point to Ponder: Making Good Choices Is a Skill

"I want my students to be independent, and it can be frustrating that they just can't make decisions for themselves. I hadn't thought I might need to actually teach decision-making skills."

—Secondary study skills teacher

When we think of making good choices as a skill, much like writing an effective paragraph or essay, it becomes easy enough to understand that we need to encourage students to make their own choices. In keeping with this analogy, students could certainly figure out how to write on their own, and perhaps even how to compose sentences and paragraphs, by modeling other examples. Imagine, however, the progress and strength of the writing produced when students are given guidance and even the most basic of instruction on how to accomplish the task. The written piece is still their own, but the quality of the finished piece is much stronger when guidance is given during the process. There is a reason why class time is spent in the AP classroom focusing on how to write an appropriate response to a document-based question (DBQ) or a free-response question (FRQ). Students need to practice these skills before the big test is May. The same is true with choices; the quality of choices our high school students can make in the classroom is directly impacted by exposure and practice.

As with writing, students can make choices on their own, but when the teacher provides background knowledge and assistance, the choices

become more meaningful and the products richer. All students certainly need guidance (even if our strong-willed high school students think they know it all), as the idea of choice may be new to them. Some students may only have experienced basic instructional choices, like choosing between two journal prompts or perhaps having the option of making either a poster or a PowerPoint presentation about the content being studied. Some may not have experienced even this level of choice. This lack of experience can cause frustration for both teacher and students alike.

Teaching Choices as a Skill

So what is the best way to provide this guidance and develop students' skill of making good choices while still allowing them to develop their individualities? First, identify the appropriate number of choices for your students. Although the goal might be to have students choose between 20 different options, teachers might start by having their students choose from three predetermined choices the first day (if they were using a game show menu, for example, students might choose an activity from the first column). Then, after those products have been created, students can choose between another set of three options a few days later and perhaps another three the following week. By breaking down students' choices, teachers are reinforcing how to approach a more complex and/or varied choice format in the future. All students can work up to making complex choices from longer lists of options as their choice skill level increases.

Second, although high school students feel they know everything at this point in time, they still may need guidance on how to select the option that is right for them. They may not automatically gravitate toward options without an exciting and detailed description of each choice. For the most part, students have been trained to produce what the teacher requests, which means that when given a choice, they may choose what seems to be the easiest and what the teacher most wants (then they can get to what they would prefer to be doing). This means that when the teacher discusses the different menu options, he or she has to be equally as excited about each option. The discussion of the different choices has to be somewhat animated and specific. For example, if the content is all very similar, the focus should be on the product: "If you want to create something you might see on YouTube, this one is for you!" or "If you want to be artistic, check this one as a maybe!" The more exposure students

have to the think-aloud processing the teacher provides, the more skillful they become in making their own choices.

How Can Teachers Allow Choice?

"The GT students seem to get more involved in assignments when they have choice. They have so many creative ideas and the menus give them the opportunity to use them."

—Secondary social studies teacher

When people go to a restaurant, the common goal is to find something on the menu to satisfy their hunger. Students come into our classrooms having a hunger as well—a hunger for learning. Choice menus are a way of allowing our students to choose how they would like to satisfy that hunger. At the very least, a menu is a list of choices that students use to select an activity (or activities) they would like to complete to show what they have learned. At best, it is a complex system in which students are given point goals and complete different products to earn points (which are based on the levels of Bloom's revised taxonomy; Anderson & Krathwohl, 2001). The menus should incorporate a free-choice option for those "picky eaters" who would like to place a special order to satisfy their learning hunger.

The next few sections provide examples of the types of menus that will be used in this book. Each menu has its own benefits, limitations or drawbacks, and time considerations. An explanation of the free-choice option and its management will follow the information on each type of menu.

Tic-Tac-Toe Menu

"My students really enjoy the Tic-Tac-Toe menus, and I get them to stretch themselves without them realizing it."

—High school AP World Geography teacher

Description

The Tic-Tac-Toe menu (see Figure 1) is a well-known, commonly used menu that contains a total of eight predetermined choices and, if appropriate, one free choice for students. These choices can range from task statements leading to product creation, to complex and/or higher level processing questions, to leveled problems for solving. Choices can be created at the same level of Bloom's revised taxonomy or be arranged in a way to allow for three different levels or objectives within a unit or topic. If all choices have been created at the same level of Bloom's revised taxonomy, each choice carries the same weight for grading and has similar expectations for completion time and effort.

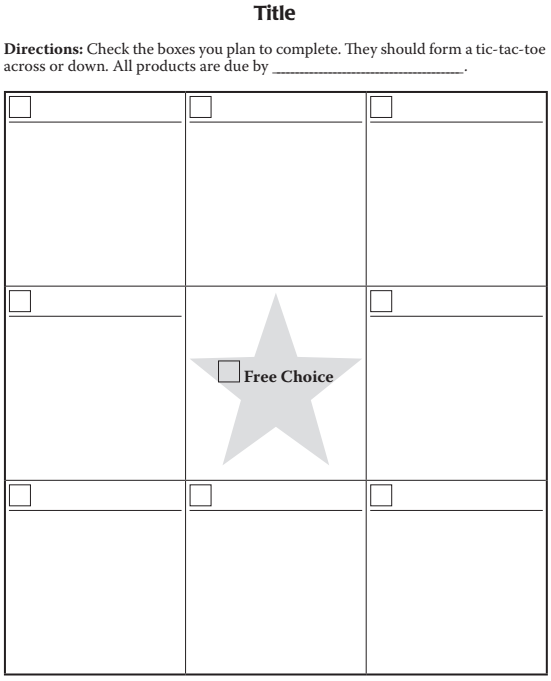


Figure 1. Tic-Tac-Toe menu example.

Benefits

Flexibility. This menu can cover either one topic in depth or three different objectives within one content area. When this menu covers just one objective, all at the same level of Bloom's revised taxonomy (preferably the highest), students have the option of completing three products in a tic-tac-toe pattern or simply picking three from the menu. When it covers three objectives or multiple levels of Bloom's revised taxonomy, students will need to complete a tic-tac-toe pattern (one in each column or row) to be sure they have completed one activity from each objective or level.

Challenge level. When students make choices on this menu to complete a row or column, based on its design, they will usually face one choice that is out of their comfort zone, be it for its level of Bloom's revised taxonomy, its product learning style, or its content. They will complete this "uncomfortable" choice because they want to do the other two options in that row or column.

Friendly design. Students quickly understand how to use this menu. It is nonthreatening because it does not contain points, therefore it seems to encourage students to stretch out of their comfort zones.

Weighting. All products are equally weighted, so recording grades and maintaining paperwork are easily accomplished with this menu.

Short time period. This menu is intended for shorter periods of time, between 1–3 weeks.

Limitations

Few topics. This menu only covers one or three topics.

Student compromise. Although this menu does allow choice, a student will sometimes have to compromise and complete an activity he or she would not have chosen because it completes the required tic-tac-toe. (This is not always bad, though!)

Time Considerations

This menu usually is intended for shorter periods of completion time—at most, it should take 3 weeks with students working outside of class and submitting one product each week. If the menu focuses on one topic in depth and the students have class time to work on their products, it can be completed in one week.

Meal Menu

> *"Seemed pretty easy at first—after all, it was only three things and I was thinking I would just have to draw a few equations. All the lunch and dinner real-world stuff was hard—[I] had to really think."*
>
> —High school Algebra II student

Description

The Meal menu (see Figure 2) is a menu with a total of at least nine predetermined choices as well as two or more enrichment activities for students. The choices are created at the various levels of Bloom's revised taxonomy and incorporate different learning styles, with the levels getting progressively higher and more complex as students progress from breakfast to lunch and then dinner. All products carry the same weight for grading and have similar expectations for completion time and effort. The enrichment options (dessert) can be used for extra credit or

replace another meal option at the teacher's discretion.


Title

Directions: You must choose one activity each for breakfast, lunch, and dinner. Dessert is an activity you can choose to do after you have finished your other meals.

Breakfast

❑ _____
❑ _____
❑ _____

Lunch

❑ _____
❑ _____
❑ _____

Dinner

❑ _____
❑ _____
❑ _____

Dessert

❑ _____
❑ _____

Figure 2. Meal menu example.

Benefits

Great starter menu. This menu is very straightforward and easy to understand, so time is saved in presenting the completion expectations.

Flexibility. This menu can cover either one topic in depth or three different objectives, with each meal representing a different objective. With this menu, students have the option of completing three products: one for each meal.

Optional enrichment. Although not required, the dessert category allows students to have the option of going further or deeper into the unit if time permits.

Chunkability. This menu is very easy to break apart into smaller pieces. Whether you have students who need support in making choices or you only want to focus on one aspect of a topic at a time, this menu can accommodate these decisions. Students could be asked to select a breakfast activity while the rest of the menu is put on hold until the product is submitted; once completed, a lunch product is selected, and so on.

Friendly design. Students quickly understand how to use this menu because of its real-world application.

Weighting. All products are equally weighted, so recording grades and maintaining paperwork are easily accomplished with this menu.

Short time period. This menu is intended for shorter periods of time, between 1–3 weeks.

Limitations

Few topics. This menu only covers one or three topics.

Time Considerations

This menu usually is intended for shorter periods of completion time—at most, it should take 3 weeks with students working outside of class and submitting one product each week. If the menu focuses on one topic in depth and the students have class time to work on their products, it can be completed in one week.

List Menu

"I really liked the flexibility of the List menu we used. We actually moved through our unit more quickly than I anticipated so I just changed the points they needed to earn instead of trying to find additional activities for the last two days. It was great."

—World history teacher

Title

Guidelines:

1. You may complete as many of the activities listed as you can within the time period.
2. You may choose any combination of activities, but **must** complete at least one activity from each topic area.
3. Your goal is 100 points. You may earn up to _____ points extra credit.
4. You may be as creative as you like within the guidelines listed below.
5. You must share your plan with your teacher by _____.
6. Activities may be turned in at any time during the working time period. They will be graded and recorded on this sheet as you continue to work, so keep it safe!

Topic	Plan to Do	Activity to Complete	Point Value	Date Completed	Points Earned
		Total number of points you are planning to earn.		**Total points earned:**	

I am planning to complete ____ activities that could earn up to a total of _____ points.

Teacher's initials _____ Student's signature _____

Figure 3. List menu example.

Description

A List menu (see Figure 3) has a total of at least 10 predetermined choices, each with its own point value, and at least one free choice for students. There are two versions of the List menu: the Challenge List menu, which covers one topic in depth, and the Three-Topic List menu, which accommodates three topics. In the one-topic Challenge List menu, topic choices are listed with assigned points based on the levels of Bloom's revised taxonomy. The choices carry different weights and have different expectations for completion time and effort. In the Three-Topic List menu, choices are also assigned points based on Bloom's revised taxonomy and carry different weights; however, the choices are separated by topics listed on the left side of the menu. With both formats, a point criterion is set forth that equals 100%, and students choose how they wish to attain that point

goal based on the guidelines set forth on the top of each specific content menu. This List menus included in this book are all Three-Topic List menus.

Benefits

Responsibility. Students have complete control over their grades. They really like the idea that they can guarantee their grades if they complete their required work and meet the expectations set forth in the rubric. If students lose points on one of the chosen products, then they can complete another to be sure they have met their goal points. This responsibility over their own grades also allows a shift in thinking about grades: Whereas many secondary students think of grades in terms of how the teacher judged their work or what the teacher *gave* them, having control over their grades leads students to understand that they *earn* them.

Different learning levels. This menu also has the flexibility to allow for individualized contracts for different learning levels within the classroom. Even within an Advanced Placement classroom, there can be many ability levels. One way to address this is by preassessing students at the beginning of a unit. Based on the results obtained by this preassessment, students can be contracted (see the bottom of the List menu) for different point goals. If a student shows significant proficiency in the content, then his or her point goal might be 140/140 for a 100%. If the student needs additional practice at a more basic level, then his or her contracted goal may be 75/75 to receive a 100%.

Concept reinforcement. This menu allows for an in-depth study of material; however, with the different levels of Bloom's revised taxonomy being represented, students who are still learning the concepts can choose some of the lower level point value projects to reinforce the basics before jumping into the higher level activities.

Variety. A List menu offers a larger variety of product choices. There is guaranteed to be a product of interest to everyone.

Limitations

Cannot guarantee objectives. If the traditional challenge menu is used for more than one topic, it is possible for a student to not complete an activity for each objective, depending on the choices he or she makes.

Preparation. Teachers need to have all materials ready at the beginning of the unit for students to be able to choose any of the activities on the list, which requires advanced planning. (Note: Once the materials are assembled, the preparation is minimal!)

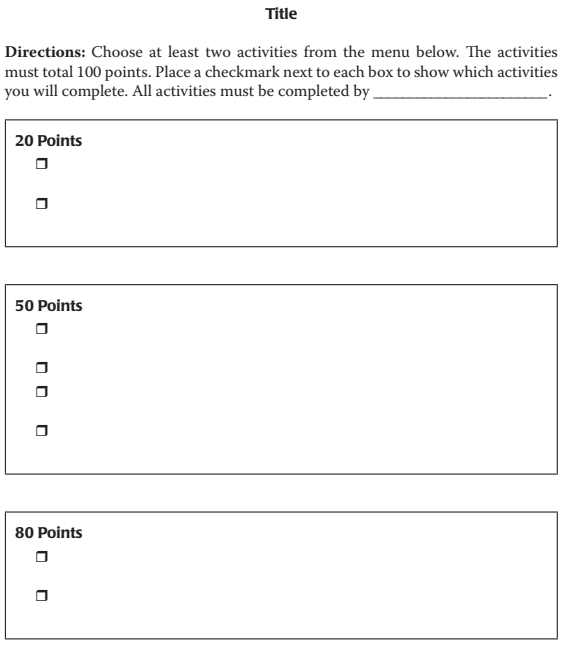
Time Considerations

This menu is usually intended for shorter amounts of completion time—at the most, 2 weeks.

20-50-80 Menu

"As you suggested, I used one of your 20-50-80 menus as homework to review equations of a line the week before we went into solving systems of equations. It was very easy for the students to understand and saved so much time at the beginning of the systems unit. I am going to use these more often."

—High school Algebra I teacher



Title

Directions: Choose at least two activities from the menu below. The activities must total 100 points. Place a checkmark next to each box to show which activities you will complete. All activities must be completed by _____.

20 Points

❒

❒

50 Points

❒

❒

❒

❒

80 Points

❒

❒

Figure 4. 20-50-80 menu example.

Description

A 20-50-80 menu (see Figure 4), is a variation on a List menu, with a total of at least eight predetermined choices: two choices with a point value of 20, at least four choices with a point value of 50, and at least two choices with a point value of 80. Choices are assigned points based on the levels of Bloom's revised taxonomy. Choices with a point value of 20 represent the *remember* and *understand* levels, choices with a point value of 50 represent the *apply* and *analyze* levels, and choices with a point value of 80 represent the *evaluate* and *create* levels. All levels of choices carry different weights and have different expectations for completion time and effort. Students are expected to earn 100

points for a 100%. Students choose what combination they would like to complete to attain that point goal.

Benefits

Responsibility. With this menu, students have complete control over their goals and grades.

Guaranteed activity. This menu's design is set up in such a way that students must complete at least one activity at a higher level of Bloom's revised taxonomy in order to reach their point goal.

Low stress. This menu is one of the shortest menus; if students choose well, they can accomplish their goal by completing only two products. This menu is usually less daunting than some of the longer, more complex menus. It provides students a great introduction to the process of making choices.

Limitations

One topic. Although it can be used for more than one topic, this menu works best with an in-depth study of one topic.

No free choice. By nature, this menu does not allow students to propose their own free choice, because point values need to be assigned based on Bloom's revised taxonomy.

Limited higher level thinking. Students will complete only one activity at a higher level of thinking.

Time Considerations

This menu is usually intended for a shorter amount of completion time—at the most, one week.

Game Show Menu

"It was different, doing a [Game Show] menu. I had to really consider how I was going to get enough points but still do all the topics. By the time I was done, at least I knew I got a 100% on a major grade."

—High school U.S. history student

Title

Topic	Topic	Topic	Topic	Topic	Points for Each Level
❒	❒	❒	❒	❒	15 points
❒	❒	❒	❒	❒	25 points
❒	❒	❒	❒	❒	30 points
Free Choice (prior approval) (25–50 pts.)	**Free Choice** (prior approval) (25–50 pts.)	**Free Choice** (prior approval) (25–50 pts.)	**Free Choice** (prior approval) (25–50 pts.)	**Free Choice** (prior approval) (25–50 pts.)	25–50 points
Total:	**Total:**	**Total:**	**Total:**	**Total:**	**Total Grade:**

Figure 5. Game Show menu example.

Description

The Game Show menu (see Figure 5) is a complex menu. It covers multiple topics or objectives with three predetermined choices and a free student choice for each objective. Choices are assigned points based on the levels of Bloom's revised taxonomy. All choices carry different weights and have different expectations for completion time and effort. A point criterion is set forth that equals 100%. Students must complete at least one activity from each objective in order to reach their goal.

Benefits

Free choice. This menu allows many choices for students, but if they do not want to complete the offered activities, they can propose their own activity for each objective.

Responsibility. With this menu, students have complete control over their own grades.

Different learning levels. This menu has the flexibility to allow for individualized contracts for different learning levels within the classroom. Each student can contract for a certain number of points for his or her 100%.

Objectives guaranteed. The teacher is guaranteed that the students complete an activity from each objective covered, even if it is at a lower level.

Limitations

Confirm expectations. The only real limitation for this menu is that students must understand the guidelines for completing the menu.

Time Considerations

This menu is usually intended to be completed for a longer amount of completion time. Although it can be used as a yearlong menu (each column could be a grading period), it is usually intended for 2–3 weeks.

Free Choice

"I try to bring in real-world application for each concept we cover. Sometimes the students simply answer, 'How does this apply to your life?' So, now I let them use the free choice proposals and they can create something to show me the application of the material."

—High school AP Chemistry teacher

Most of the menus included in this book allow students to submit a free-choice product for their teacher's consideration. Figure 6 shows two sample proposal forms that have been used successfully in my classroom. The form used is based on the type of menu being presented. For example, if you are using the Tic-Tac-Toe or Meal menu, there is no need to submit the proposal form for point-based menus. A copy of the appropriate form should be given to each student when the menu is first introduced. The form should be discussed with the students so they understand the expectations of a free choice. If students do not want to make a proposal using the proposal form after the teacher has discussed the entire menu and its activities, then they can place the unused form in a designated place in the classroom (I always had a box of blank proposal forms on my supply table so unused forms could be returned there). Others may want to use their forms, and it is often surprising who wants to submit a proposal form after hearing about the opportunity!

Proposal forms must be submitted before students begin working on their free-choice products. The teacher then knows what the students are working on, and the student knows the expectations the teacher has for that product. Once the project has been approved, the form can easily

Name: _____ Teacher's Approval: _____

Free-Choice Proposal Form

Proposal Outline

1. What objective, standard, or topic will you be working with?

2. What criteria should be used to grade it (e.g., neatness, content, creativity, artistic value)?

3. What will your product look like?

4. What materials will you need from the teacher to create this product?

Name: _____ Teacher's Approval: _____

Free-Choice Proposal Form for Point-Based Menu

Points requested: _____ Points approved: _____

Proposal Outline

1. What objective, standard, or topic will you be working with?

2. What criteria should be used to grade it (e.g., neatness, content, creativity, artistic value)?

3. What will your product look like?

4. What materials will you need from the teacher to create this product?

Figure 6. Sample proposal forms for free choice.

be stapled to the student's menu sheet. The student can refer to the form while developing the free-choice product, and when the grading takes place, the teacher can refer to the agreement for the graded features of the product.

Each part of the proposal form is important and needs to be discussed with students:

- *Name/Teacher's Approval.* The student must submit this form to the teacher for approval. The teacher will carefully review all of the information, discuss any suggestions or alterations with the student, if needed, and then sign the top.
- *Points Requested.* Found only on the point-based menu proposal form, this is where negotiation may need to take place. Students usually will submit their first request for a very high number (even the 100% goal). They tend to equate the amount of time something will take with the number of points it should earn. But please note that the points are always based on the levels of Bloom's revised taxonomy. For example, a PowerPoint presentation with a vocabulary word quiz would get minimal points, although it may have taken a long time to create. If the students have not been exposed to the levels of Bloom's revised taxonomy, this can be difficult to explain. You can always refer to the popular "Bloom's Verbs" to help explain the difference between time-consuming and higher level activities.
- *Points Approved.* Found only on the point-based menu proposal form, this is the final decision recorded by the teacher once the point haggling is finished.
- *Proposal Outline.* This is where the student will tell you everything about the product he or she intends to complete. These questions should be completed in such a way that you can really picture what the student is planning to complete. This also shows you that the student knows what he or she plans to complete.
    - *What objective, standard, or topic will you be working with?* Students need to be specific here. It is not acceptable to write "math." This is where students look at the objectives of the lesson and choose which objective their product demonstrates.
    - *What criteria should be used to grade it (e.g., neatness, content, creativity, artistic value)?* Although there are rubrics for all of the products that the students might create, it is important for the students to explain what criteria are most important to evaluate the product. The student may indicate that the rubric

being used for all of the predetermined products is fine; however, he or she may also want to add other criteria here.

- *What will your product look like?* It is important that this response be as detailed as possible. If a student cannot express what it will look like, then he or she has probably not given the free-choice plan enough thought.
- *What materials will you need from the teacher to create this product?* This is an important consideration. Sometimes students do not have the means to purchase items for their project. This can be negotiated as well, but if you ask what students may need, they will often develop even grander ideas for their free choice.

The Menus

How to Use the Menu Pages

Each topic in this section has:

- an introduction page for the teacher,
- the content menu,
- specific guidelines for the menu, and
- activities mentioned in the menu.

Introduction Pages

The introduction pages for each topic are meant to provide an overview of each set of menus. They are divided into the following areas:

- *Objectives Covered Through the Menu and Activities.* This area will list all of the objectives that the menu can address. Menus are arranged in such a way that if students complete the guidelines set forth in the instructions, all of these objectives will be covered.
- *Materials Needed by Students for Completion*. For each menu, it is expected that the teacher will provide, or students will have access to, the following materials:

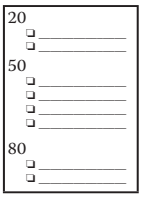
- lined paper,
- glue,
- colored pencils or markers, and
- blank 8.5" × 11" white paper.

The introduction page also includes a list of additional materials that may be needed by students. Because students have the choice of which menu items they would like to complete, it is possible that the teacher will not need all of the additional materials for every student.

- *Special Notes on the Use of This Menu*. Some menus allow students to choose to present demonstrations, songs, news reports, or PowerPoint presentations to their classmates. This section will give any special tips on managing products that may require more time, supplies, or space. This section will also share any tips to consider for a specific activity.
- *Time Frame.* Each menu has its own ideal time frame based on its structure, but all work best with at least a one-week time frame. Menus that assess more objectives are better suited to more than 2 weeks. This section will give you an overview about the best time frame for completing the entire menu, as well as options for shorter time periods. If teachers do not have time to devote to completing an entire menu, they can choose the 1–2-day option for any menu topic students are currently studying.
- *Suggested Forms.* This section lists the rubrics and reproducibles that should be available for students as the menus are introduced. If a menu has a free-choice option, the appropriate proposal form will also be listed here.
- *Answers to Menu Problems.* Some of the menus in this book are product/problem menus; they contain product options as well as word problems. The word problems included on these types of menus usually require multiple steps and the synthesizing of the information being presented throughout the unit. If a menu has both products and problems, this section will share the answers to the problems as well as the steps taken to solve each. Of course, there can certainly be more than one way to solve a word problem, so answers included in the book represent just one method that can be used to solve each problem.

Chapter 5

Properties of Numbers



Mathematical Vocabulary and Concept Review

20-50-80 Menu

Objectives Covered Through This Menu and These Activities

- Students will demonstrate knowledge of key vocabulary words.
- Students will identify vocabulary words associated with the current unit of study.

Materials Needed by Students for Completion

- Blank index cards (for trading cards)
- Graph paper or Internet access (for crossword puzzles)
- DVD or VHS recorder (for documentaries)

Special Notes on the Use of This Menu

- This menu gives students the opportunity to create a documentary. Although students enjoy producing their own videos, there often are difficulties obtaining the equipment and scheduling the use of a video recorder. This activity can be modified by allowing students to act out the documentary (like a play) or, if students have the technology, allowing them to produce a webcam version of their product.

Time Frame

- 1–2 weeks—Students are given a menu as the unit is started, and the teacher discusses all of the product options on the menu. As the different options are discussed, students will choose the activities they are most interested in completing so they meet their goal of 100 points. As the lessons progress, the teacher and students refer back to the menu options associated with the content being taught.
- 1–2 days—The teacher chooses an activity or product from the menu to use with the entire class.

Suggested Forms

- All-purpose rubric
- Oral presentation rubric
- Proposal form for point-based projects

Name:_____ Date:_____

Mathematical Vocabulary and Concept Review

Directions: Choose at least two activities from the menu below. The activities must total 100 points. Place a check mark next to each box to show which activities you will complete. All activities must be completed by _____.

20 Points

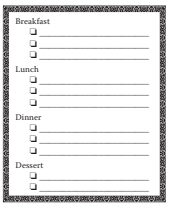
- ❒ Create a windowpane for all of the vocabulary words or concepts from this unit.
- ❒ Design a crossword puzzle using the concepts or vocabulary words from this unit.

50 Points

- ❒ Select two of the vocabulary concepts and create a Venn diagram to compare and contrast the two ideas.
- ❒ Brainstorm three facts and a fib for the word or concept that others seem to find most confusing in this unit.
- ❒ Design a set of trading cards for five of the most important concepts being discussed in this unit.
- ❒ **Free choice**—Submit a proposal form to your teacher for a product of your choice.

80 Points

- ❒ Write a fictional children's book that integrates all of the important concepts or vocabulary discussed in this unit. Your book does not need to have a mathematical theme, but the words or concepts must be used correctly and focus on real-world applications.
- ❒ You have been hired by Dr. Matt Whiz to create a documentary about the current unit. It should include vocabulary as well as the importance of these concepts in our daily lives.



Writing and Interpreting Algebraic Expressions

Meal Menu

Objectives Covered Through This Menu and These Activities

- Students will brainstorm real-world examples when given an algebraic expression.
- Students will write algebraic expressions from real-world examples.
- Students will identify key vocabulary and its mathematical equivalent when writing algebraic expressions.
- Students will investigate different careers that depend on the use of algebra (dessert option only).

Materials Needed by Students for Completion

- Poster board or large white paper
- Blank index cards (for concentration cards)
- DVD or VHS recorder (for commercials and news reports)
- Materials for bulletin board displays
- Scrapbooking materials
- Newspapers and magazines (for scrapbooks)

Special Notes on the Use of This Menu

- This menu gives students the opportunity to create a commercial and a news report. Although students enjoy producing their own videos, there often are difficulties obtaining the equipment and scheduling the use of a video recorder. This activity can be modified by allowing students to act out the commercial or news report (like a play) or, if students have the technology, allowing them to produce a webcam version of their product.
- This menu allows students to create a bulletin board display. Some classrooms may only have one bulletin board, so the teacher can divide the board into sections, or additional classroom wall or hall space can be sectioned off for the creation of these displays. Students can plan their display based on the amount of space they are assigned.

Time Frame

- 1–3 weeks—Students are given the menu as the unit is started. As the lesson or unit progresses throughout the week, students should refer back to the menu options associated with that content. The teacher

will go over all of the options for that content and have students place a check mark in the box for each option that represents the activity they are most interested in completing. As teaching continues, the activities chosen and completed should create a full day's meal, with a breakfast, a lunch, a dinner, and an optional dessert. The teacher may choose to allow students time to work after other work is finished. When students complete the menu with this expectation, they have completed one activity from each content area, learning style, or level of Bloom's revised taxonomy, depending on the design of the menu.

- 1–2 days—The teacher chooses an activity or product from an objective to use with the entire class during that lesson time.

Suggested Forms

- All-purpose rubric
- Oral presentation rubric
- Free-choice proposal form

Name:_____ Date:_____

Writing and Interpreting Algebraic Expressions

Directions: Choose one activity each for breakfast, lunch, and dinner. Dessert is an activity you can choose to do after you have finished your other meals. All products must be completed by: _____.

Breakfast

- ❒ Create a set of concentration cards that allows users to match a list of real-world situations and the algebraic expressions that would represent them. Be sure to include addition, subtraction, multiplication, and division in your situations!
- ❒ Brainstorm at least 10 different situations that can be expressed through algebraic expressions. Use these situations to create a folded quiz book for the material.
- ❒ Make a poster that shares all of the common words and phrases, and then show how each is expressed in an algebraic number sentence. Share at least one real-world example for each word or phrase and its number sentence equivalent.

Lunch

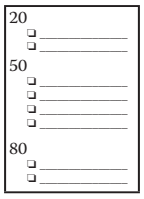
- ❒ Looking through newspapers and magazines, collect examples of situations that could be expressed algebraically. Create a scrapbook of your examples and the algebraic expression that accompanies each.
- ❒ Create a worksheet that asks your classmates to write algebraic expressions to match the situations they might encounter on a daily basis.
- ❒ Choose a situation that could be represented algebraically. Create three facts and fib about the expression created from the situation.

Dinner

- ❒ Create a commercial about a special bargain available to customers. The bargain is represented by: $124-3(x+10)$.
- ❒ Consider the following algebraic expression: $2(x+4)-3$. Create a play that shows the situation behind this expression. Be expressive and creative in your story development.
- ❒ Prepare a local news report that explains what this happening in the following algebraic expression: $742+4(x+15)$.

Dessert

- ❒ Research two careers that depend on algebra and algebraic expressions (other than a math teacher!). Prepare a bulletin board display that shares information on these careers.
- ❒ **Free choice**—Submit a proposal form to your teacher for a product of your choice.



Number Properties

20-50-80 Menu

Objectives Covered Through This Menu and These Activities

- Students will show understanding and provide examples of the communicative, associative, and distributive properties.

Materials Needed by Students for Completion

- Poster board or large white paper
- Aluminum foil (for quiz boards)
- Holiday lights (for quiz boards)
- Wires (for quiz boards)
- Recycled materials (for models)
- Materials for bulletin board displays
- DVD or VHS recorder (for commercials)

Special Notes on the Use of This Menu

- This menu gives students the opportunity to create a commercial. Although students enjoy producing their own videos, there often are difficulties obtaining the equipment and scheduling the use of a video recorder. This activity can be modified by allowing students to act out the commercial (like a play) or, if students have the technology, allowing them to produce a webcam version of their product.
- This menu asks students to use recycled materials to create their models. This does not mean only plastic and paper; instead, students should focus on using materials in new ways. It works well if a box is started for recycled contributions at the beginning of the school year. That way, students always have access to these types of materials.
- This menu allows students to create a bulletin board display. Some classrooms may only have one bulletin board, so the teacher can divide the board into sections, or additional classroom wall or hall space can be sectioned off for the creation of these displays. Students can plan their display based on the amount of space they are assigned.
- This menu gives students an opportunity to create a quiz board. A student-friendly information sheet that offers the steps for constructing a quiz board is available at http://www.cesiscience.org/attachments/article/100/QuizBoardDirections.pdf.

Time Frame

- 1–2 weeks—Students are given a menu as the unit is started, and the teacher discusses all of the product options on the menu. As the different options are discussed, students will choose the activities they are most interested in completing so they meet their goal of 100 points. As the lessons progress, the teacher and students refer back to the menu options associated with the content being taught.
- 1–2 days—The teacher chooses an activity or product from the menu to use with the entire class.

Suggested Forms

- All-purpose rubric
- Oral presentation rubric
- Proposal form for point-based projects

Name:_____ Date:_____

Number Properties

Directions: Choose at least two activities from the menu below. The activities must total 100 points. Place a check mark next to each box to show which activities you will complete. All activities must be completed by _____.

20 Points

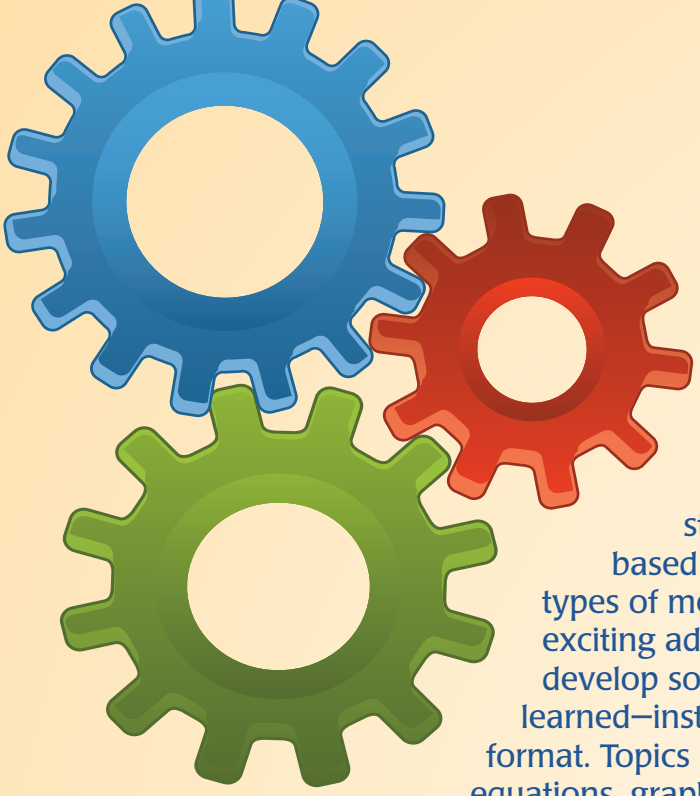
- ❒ Create a quiz board that has players identify examples of different number properties. Be creative in your examples—try to make some tricky.
- ❒ Design an acrostic for the associative, communicative, or distributive properties. Rather than each letter of the word starting a phrase, have each letter begin an algebraic example of the property. Use variety in your examples!

50 Points

- ❒ Create a bulletin board display that shows the reasoning or proof behind each number property. Use drawings of algebra tiles, counters, or graphics to demonstrate each in your display.
- ❒ Write and perform a children's song to help others remember the differences between the associative, communicative, and distributive properties.
- ❒ Using recycled materials, build a model that shows how each of these properties is interrelated with each other.
- ❒ **Free choice**—Submit a proposal form to your teacher for a product of your choice.

80 Points

- ❒ Write a story that provides examples of the associative, communicative, and distributive properties. Your story should not be math related but the examples should represent real-world analogies for these mathematical properties.
- ❒ Prepare a commercial in which the distributive property plays a key role in the selling of a product. Although you may mention the term distributive property, the commercial should not be about a mathematical product.



Differentiating Instruction With Menus: Algebra I/II for grades 9–12 offers teachers everything needed to create a student-centered learning environment based on choice. This book uses five different types of menus that students can use to select exciting advanced-level products that they will develop so teachers can assess what has been learned—instead of using a traditional worksheet format. Topics addressed include properties of numbers, equations, graphing, and polynomials.

Differentiating Instruction With Menus: Algebra I/II contains attractive reproducible menus, each based on the levels of Bloom's revised taxonomy as well as incorporating different learning styles. These menus can be used to guide students in making decisions as to which products they will develop after studying a major concept or unit. Using the creative and challenging choices found in Meal menus, Tic-Tac-Toe menus, List menus, 20-50-80 menus, and Game Show menus, students will look forward to sharing their newfound knowledge throughout the year. Also included are specific guidelines for products, rubrics for assessing student products, and teacher introduction pages for each menu. This is a must-have for any teacher wanting to differentiate for gifted and advanced learners!

Laurie E. Westphal was a teacher for more than 15 years and now works as an independent gifted education consultant, educating teachers nationwide about using differentiation to meet the needs of all learners. She has written many books on the topic of differentiation, including the Differentiating Instruction With Menus series and the Differentiating Instruction With Menus for the Inclusive Classroom series.

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