Cookie Contest

This MEA asks students to decide which factors are important in choosing the best cookie in a cookie contest. Students will take on the role of cookie critics to provide feedback to a teacher whose grade level is deciding which cookie to use for a fundraiser. They will rank order their choices from the best to worst cookie. Students will provide a detailed written explanation for how they decided to rank factors and their solution. They will show their work while adding up to 4 two-digit numbers to calculate the total number of votes.

General Information

Subject(s): Mathematics, English Language Arts
Grade Level(s): 2
Intended Audience: Educators

Suggested Technology: Computer for Presenter, LCD Projector, Microsoft Office

Instructional Time: 2 Hour(s) 30 Minute(s)

Resource supports reading in content area: Yes

Freely Available: Yes

Keywords: MEA, add, addition, two-digit, place value, read aloud, problem solving, cookie, cookies, contest, fundraiser, ingredients
Instructional Component Type(s): **Lesson Plan,** Problem-Solving Task, Assessment, Text Resource, Instructional Technique, Data Set, Formative Assessment, Model Eliciting Activity (MEA) STEM Lesson
Resource Collection: STEM Lessons - Model Eliciting Activity

Lesson Content

Lesson Plan Template: Model Eliciting Activity (MEA)

Formative Assessment

Readiness questions will be used as a formative assessment after students read the first client letter.

Readiness Questions:

1. Who is the client?
2. What is the client's problem?
3. What does the client need from you in a written letter?
4. What could you create in order to solve the problem?
5. What are the required components that you need to include in your letter to the client?
6. What problem(s) might be an obstacle in solving this problem for the client?

Feedback to Students

The teacher will introduce the MEA topic and description. Students will then work in small groups to complete tasks. The teacher will provide feedback to students by circulating the room to ask and answer questions to groups. The teacher will conduct an Educative Assessment by asking the first set of Reflection Questions and giving feedback to each group regarding their procedure. A class discussion focused on Reflection Questions will be facilitated by the teacher after the teacher has met with all groups.

Reflection Questions (Set 1)

1. What procedure did you use to rank the cookies from best to worst?
2. What were the additional procedures you used to rank the cookies?
3. How and why did you decide which procedure would be the best to use?

Reflection Questions (Set 2)

1. How was the procedure changed to rank the cookies from best to worst?
2. Was the outcome different after the second set was introduced and if so, why?

Summative Assessment

The teachers will determine if students have reached Learning Objectives by asking Reflection Questions (Set 2) to groups then facilitating another class discussion. Learning objectives are met if students are able to explain the procedure for their solution in detail, verbally defend their choice of procedure over other possible choices, and accurately complete calculations for adding four 2-digit numbers to find the total number of cookie votes, using manipulatives to model and drawing pictures to represent calculations in Math Notebooks or on a separate sheet of paper.

Learning Objectives

The students will be able to use prior knowledge of adding two-digit numbers and problem solving skills to solve a non-routine MEA (Model Eliciting Activity) that requires real-world application of mathematical skills.

Students will do the following:

- Engage in collaborative discussions to express and defend ideas
- Scaffold on ideas of peers
- Communicate their ideas and their procedure clearly through detailed writing to answer the question, gathering information from a provided source
- Add four 2-digit numbers using place value strategies and properties of operations (as well as manipulatives and drawings to show understanding)
- Problem solve to rank cookies from best to worst

Prior Knowledge

The students need to know how to do the following:

- Effectively communicate ideas
- Collaborate as a team
- Complete problem solving steps
- Add four 2-digit numbers, using place value strategies, properties of operations, manipulatives and drawings
- Write a business letter (using a template)
- Write the steps to a procedure
- Compare two-digit numbers
- Interpret a data table

Instructional Suggestions

1. The teacher will introduce the MEA topic and description.
2. **HOOK (Optional):** Teacher can choose a read aloud book such as *One Smart Cookie: Bite-Sized Lessons for the School Year and Beyond* or *Cookies: Bite-Sized Life Lessons* by Amy Krouse Rosenthal. Teacher can use the book for vocabulary building and to facilitate a class discussion about the message of the book with students.
3. Teacher will facilitate a class discussion about the characteristics of a good cookie and list ideas on the whiteboard or chart paper.
4. Students will read Reading Passage 1 (teacher letter to students) and Data Set 1 and respond to Readiness/Comprehension questions. Teacher will facilitate class discussion to ensure understanding of the activity.
5. Students individually brainstorm several ways to solve the teacher's problem.
6. Teacher will group students into cookie critics teams based on professional judgment.
7. Students will engage in collaborative discussions and share their best solution with their groups. The teacher will facilitate discussion among the cookie critics teams. Each cookie critic team will select an idea and develop a procedure for determining the solution to the problem for the client.
8. Students will first calculate the total number of votes in their Math Notebooks or on a separate sheet of paper. Teacher will listen to and observe students as they calculate the total number of cookie votes, using manipulatives and/or drawings to model problem solving. Teacher will assess math skills by reviewing drawings of manipulatives, number calculations, and written explanation of problem solving.
9. The teacher will conduct an Educative Assessment by giving feedback to each group regarding their procedure by asking the first set of Reflection Questions. Teacher will provide additional information to students who need clarification about the activity. For example, students may have difficulty understanding they need to develop a clear and detailed procedure rather than just a final answer if this is their first Model Eliciting Activity (MEA). Teachers could do a pre-exercise with students to learn how to write a clear and detailed procedure.
10. Students write a detailed letter to the teacher explaining their choices and procedure for determining the "best to worst" cookies in the contest (Letter Template 1).
11. Students will complete Reflection Questions (Set 1) in groups. The teacher will facilitate a class discussion focused on Reflection Questions (Set 1)after the teacher has met with all groups.
12. Students receive the Reading Passage 2 (second teacher letter to students) and Data Set 2, along with their work from part one.
13. Students analyze the second set, evaluate their previous procedure, and revise their previous procedure if they feel necessary based on the Data Set 2.
14. Students complete calculations for adding four 2-digit numbers to find the total number of cookie votes by using manipulatives to model and drawing pictures to represent calculations in Math Notebooks.
15. Students write a second letter to the teacher (Letter Template 2) explaining how and why they did or did not change their procedure. If teams finish early, they can switch letters with another group to compare procedures and write a letter explaining how their procedures are alike and different or how the other team's solution could be improved.
16. Students will complete Reflection Questions (Set 2) in groups. The teacher will facilitate a class discussion focused on Reflection Questions (Set 2) after the teacher has met with all groups.
17. Teacher will collect student letters and math calculations to evaluate mastery of standards.

Supplemental Reading

Teacher can choose a read aloud book such as *One Smart Cookie: Bite-Sized Lessons for the School Year and Beyond* or *Cookies: Bite-Sized Life Lessons* (760L) by Amy Krouse Rosenthal. Teacher can use the book for vocabulary building and to facilitate a class discussion about the message of the book with students.

Guiding/reflective Questions

Guiding questions are intended to be an educative assessment to foster critical thinking about problem solving process and solutions during or following the Model Eliciting Activity (MEA). Guiding questions can be used for entire class discussion or with teams.

1. How is your team going to be "cookie critics" for the activity?
2. Why is analyzing data about different types of cookies important?

3. How are the cookies similar?
4. How are the cookies different?
5. What additional data would you add to the Data Set that could help your team make a more informed decision about the best cookie?

Reading Passage 1

Reading Passage 1 - Cookie Critics

Ms. Cookie
1 Sweet Lane
Tampa, FL 33610

Dear Cookie Critics,

I am trying to decide which cookie is the best to sell for a school fundraiser and need your help in making an excellent decision. I collected information, or data, about the cookies that teachers made for the cookie contest. The data is provided for each type of cookie, and includes how much a dozen cookies cost, how many votes it got for the best cookie, whether or not healthy ingredients were used to make it, and comments about the cookie.

Please look at the data table and calculate the total number of cookie votes. Then find a way to rank the cookies from "best to worst" based on the data. Write a letter to me explaining the rank ordering of cookies and tell me the step-by-step process of how you ranked them and made your decisions.

Things to consider about cookies:

Healthy ingredients – Some people like cookies, but want to eat healthy cookies with ingredients like oatmeal and fruits and those that are lower in fat.

I appreciate your help! I look forward to reading your letter.

Sincerely,
Ms. Cookie

Readiness Questions

Readiness Questions:

1. Who is the client?
2. What is the client's problem?
3. What does the client need from you in a written letter?
4. What could you create in order to solve the problem?
5. What are the required components that you need to include in your letter to the client?
6. What problem(s) might be an obstacle in solving this problem for the client?

Data Set 1

Data Set 1 - Cookie Contest

Letter Template 1

Letter 1 - Cookie Contest

Date: _____

Dear Ms. Cookie,

Our Team, _____, has reviewed all of the cookie data provided by your teachers. Based on the data provided, our team believes that the best cookie is _____. We created the list below to rank order types of cookies from "Best to Worst."

1. _____
2. _____
3. _____

Our team used the following procedure to make our decisions and determine the order:

Sincerely,

Comprehension / readiness questions

Review the Readiness Questions previously discussed:

1. Who is the client?
2. What is the client's problem?
3. What does the client need from you in a written letter?
4. What could you create in order to solve the problem?
5. What are the required components that you need to include in your letter to the client?
6. What problem(s) might be an obstacle in solving this problem for the client?

Reading Passage 2

Reading Passage 2 - Cookie Critics

Ms. Cookie
1 Sweet Lane
Tampa, FL 33610

Dear Cookie Critics,

Thank you for the excellent work! The information you provided helps us make decisions about the cookie to choose for the fundraiser. But, we need your help again. At the last minute, another cookie was entered in the contest. Also, I added whether each cookie is hard or chewy.

Please look at the revised data table and calculate the total number of cookie votes. Then determine whether your process for ranking the cookies still works with this new information and rank the cookies in order from best to worst. Let us know whether your process changed, and if so, how. If your process did not change please explain why not. Write a second letter to me explaining how you ordered the cookies from best to worst and your step-by-step process of making your decisions.

I appreciate all of your help! I look forward to reading your letter.

Sincerely,
Ms. Cookie

Data Set 2

Data Set 2 - Cookie Contest

Letter Template 2

Letter 2 - Cookie Contest

Date: _____

Dear Ms. Cookie,

Our Team, _____, has reviewed the second set of cookie data provided by your teachers. Based on the new data provided, our procedure (did, did not) change. The procedure (changed, did not change) because _____. Our team believes that the best cookie is _____. The list below is the rank order of types of cookies from "Best to Worst."

1. _____
2. _____
3. _____
4. _____

Our team used the following procedure to make our decisions and determine the order:

Sincerely,

Additional Instructions or Materials

Teacher needs a copy of the book *One Smart Cookie: Bite-Sized Lessons for the School Year and Beyond* or *Cookies: Bite-Sized Life Lessons* by Amy Krouse Rosenthal. Teacher needs to provide printed Reading Passages (1 and 2), Data sets (1 and 2), and Letter Templates (1 and 2).

Reflection question 2

1. Did your procedure change?
2. If your procedure changed, how was the ranking from "best to worst" the same or different?
3. If your procedure did not change, why not?

Accommodations & Recommendations

Accommodations:

- Teacher can have students complete the (Model Eliciting Activity) MEA as a whole class as an introduction to MEAs.
- Teacher can have students work in either heterogeneous or homogeneous groups.
- Teacher can have students complete the process orally and can transcribe the written letters as a class.
- Teacher can break lesson into smaller mini-lessons completed over several days.

Extensions:

- Teachers can bring in different types of cookies and have students vote on the one they like best as a class. They can use the information to write their own word problems or solve teacher-created word problems that involve money (ex. total cost for buying multiple dozens of cookies, in whole dollar amounts) or graphing results of the class vote. These activities will meet math standards (MAFS.2.MD.3.8 and MAFS.2.MD.4.10).
- Teachers could incorporate student research about healthy ingredients. Students could compare and contrast by looking at recipes for healthier and less healthy cookies.

Suggested Technology: Computer for Presenter, LCD Projector, Microsoft Office

Special Materials Needed:

Teachers needs to provide printed Reading Passages (1 and 2), Data sets (1 and 2), and Letter Templates (1 and 2).

Additional Information/Instructions

By Author/Submitter

This MEA, written for grade 2, can be adapted for grade 1 by changing the data slightly to reflect one-digit numbers or a combination of a two-digit and one-digit numbers. Teacher may also consider completing as a class activity that is teacher facilitated.

Source and Access Information

Name of Author/Source: Anonymously Submitted
Is this Resource freely Available? Yes
Access Privileges: Public
License: CPALMS License - no distribution - non commercial

Aligned Standards

Name	Description
MAFS.2.NBT.2.5:	Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
MAFS.2.NBT.2.6:	Add up to four two-digit numbers using strategies based on place value and properties of operations.
MAFS.2.NBT.2.7:	Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
LAFS.2.SL.1.1:	Participate in collaborative conversations with diverse partners about grade 2 topics and texts with peers and adults in small and larger groups. a. Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion). b. Build on others' talk in conversations by linking their comments to the remarks of others. c. Ask for clarification and further explanation as needed about the topics and texts under discussion.
LAFS.2.W.3.8:	Recall information from experiences or gather information from provided sources to answer a question.