TOPIC
Mathematical Reasoning, connections, and Problem Solving

KEY QUESTION
How do you create a schedule for the efficient preparation of dishes in an international buffet?

LEARNING GOALS
Students will:
• Use information from a table to create the most time-efficient schedule.
• Make decisions about whether or not a solution meets the needs of a client
• Communicate the solution clearly to the client

GUIDING DOCUMENTS
This activity has the potential to address many mathematics and science standards. Please see pages 4-5 for a complete list of mathematics and science standards.

RECOMMENDED SUPPLIES FOR ALL MODEL-ELICITING ACTIVITIES
It is recommended to have all of these supplies in a central location in the room. It is recommended to let the students know that they are available, but not to encourage them to use anything in particular.

• Overhead transparencies and transparency markers/pens, whiteboards and markers, posterboards, or other presentation tools such as a document camera.
• Calculators
• Rulers
• Markers, colored pencils, pencils
• Graph paper, lined paper
• Paper towels or tissues (for cleaning transparencies)
• Manila folders or paper clips for collecting the students’ work
• Optional: Computers with programs such as Microsoft Word and Excel

WHAT ARE MODEL-ELICITING ACTIVITIES (MEAs)?
Model-Eliciting Activities are problem activities explicitly designed to help students develop conceptual foundations for deeper and higher order ideas in mathematics, science, engineering, and other disciplines. Each task asks students to mathematically interpret a complex real-world situation and requires the formation of a mathematical description, procedure, or method for the purpose of making a decision for a realistic client. Because teams of students are producing a description, procedure, or method (instead of a one-word or one-number answer), students’ solutions to the task reveal explicitly how they are thinking about the given situation.

THE INTERNATIONAL FOOD MEA CONSISTS OF FOUR COMPONENTS:
1) Newspaper article: Students individually read the newspaper article to become familiar with the context of the problem. This handout is on pages 6.
2) Readiness questions: Students individually answer these reading comprehension questions about the newspaper article to become even more familiar with the context and beginning thinking about the problem. This handout is on page 7.
3) Problem statement: In teams of three or four, students work on the problem statement for 45 – 90 minutes. This time range depends on the amount of self-reflection and revision you want the students to do. It can be shorter if you are looking for students’ first thoughts, and can be longer if you expect a polished solution and well-written letter. The handouts are on pages 8. Each team needs the handouts on pages 8-9.
There is a follow-up question on page 10 to help students extend their knowledge to a different situation or plan to implement this meal in a Foods classroom. You may wish to hand out the recipes on pages 14-28 for the follow up question.
4) Process of sharing solutions: Each team writes their solution in a letter or memo to the client. Then, each team presents their solution to
the class. Whole class discussion is intermingled with these presentations to discuss the different solutions, the mathematics involved, and the effectiveness of the different solutions in meeting the needs of the client.

In totality, each MEA takes approximately 2-3 class periods to implement, but can be shortened by having students do the individual work during out-of-class time. The Presentation Form can be useful and is explained on page 4 and found on page 12.

**RECOMMENDED PROGRESSION OF THE MEA**

While other implementation options are possible for MEAs, it is recommended that the MEA be implemented in a cooperative learning format. Numerous research studies have proven cooperative learning to be effective at improving student achievement, understanding, and problem solving skills. In this method students will complete work individually (Newspaper article and readiness questions; as well as initial thoughts on the problem statement) and then work together as a group. This is important because brainstorming works best when students have individual time to think before working as a group. Students can be graded on both their individual and group contributions. Social skills’ discussion at the beginning of the MEA and reflection questions at the end of the MEA are also essential aspects of cooperative learning.

**Social Skills** (3-5 minutes)

Students must be taught how to communicate and work well in groups. Several social skills that are essential to group work are decision-making, asking questions, and communicating and listening. The teacher can show part of a YouTube video and discuss aspects of these skills before beginning the MEA.

(https://www.youtube.com/user/flowmathematics)

**Preparation activity:** It is useful to prepare the students to work on the International Foods MEA by discussing what the tasks that a catering company might have to do to be a successful company. It may also be useful to read and discuss Moroccan culture and the traditions associated with Moroccan meals (resources on page 27).

**Newspaper Article and Readiness Questions:**

The purpose of the newspaper article and the readiness questions is to introduce the students to the context of the problem.

(10 minutes): Give the article and the questions to the students the day before for homework. Then, in the next class, discuss as a class the answers to the readiness questions before beginning to discuss the problem statement.

**Problem Statement:**

You may want to read the problem statement to the students and then identify as a class: a) the client that the students are working for and b) the product that the students are being asked to produce. Once you have addressed the points above, allow the students to work on the problem statement. Let the students know that they will be sharing their solution to the rest of the class. Tell students you that you will randomly pick a group member to present for each group. Tell the students that they need to make sure that everyone understands their group’s solution so they need to be sure to work together well. The group member who will present can be picked by assigning each group member a number.

**Working on the Problem Statement** (35-50 minutes): Place the students in teams of three or four. Students should begin to work by sharing their initial ideas for solving the problem. If you already use teams in your classroom, it is best if you continue with these same teams since results for MEAs are better when the students have already developed a working relationship with their team members. If you do not use teams in your classroom and classroom management is an issue, the teacher may form the teams. If classroom management is not an issue, the students may form their own teams. You may
want to have the students choose a name for their team to promote unity.

*Teachers’ role:* As they work, your role should be one of a facilitator and observer. Avoid questions or comments that steer the students toward a particular solution. Try to answer their questions with questions so that the student teams figure out their own issues. Also during this time, try to get a sense of how the students are solving the problem so that you can ask them questions about their solutions during their presentations.

**Presentations of Solutions (15-30 minutes):** The teams present their solutions to the class. There are several options of how you do this. Doing this electronically or assigning students to give feedback as out-of-class work can lessen the time spent on presentations. If you choose to do this in class, which offers the chance for the richest discussions, the following are recommendations for implementation. Each presentation typically takes 3 – 5 minutes. You may want to limit the number of presentations to five or six or limit the number of presentations to the number of original (or significantly different) solutions to the MEA.

Before beginning the presentations, encourage the other students to not only listen to the other teams’ presentations but also to a) *try to understand the other teams’ solutions* and b) *consider how well these other solutions meet the needs of the client.* You may want to offer points to students that ask ‘good’ questions of the other teams, or you may want students to complete a reflection page (explanation – page 4, form – page 14) in which they explain how they would revise their solution after hearing about the other solutions. As students offer their presentations and ask questions, whole class discussions should be intermixed with the presentations in order to address conflicts or differences in solutions. When the presentations are over, collect the student teams’ memos/letters, presentation overheads, and any other work you would like to look over or assess.

**ASSESSMENT OF STUDENTS’ WORK**
You can decide if you wish to evaluate the students’ work. If you decide to do so, you may find the following Assessment Guide Rubric helpful:

*Performance Level Effectiveness: Does the solution meet the client’s needs?*

*Requires redirection:* The product is on the wrong track. Working longer or harder with this approach will not work. The students may need additional feedback from the teacher.

*Requires major extensions or refinements:* The product is a good start toward meeting the client’s needs, but a lot more work is needed to respond to all of the issues.

*Requires editing and revisions:* The product is on a good track to be used. It still needs modifications, additions or refinements.

*Useful for this specific data given, but not shareable and reusable OR Almost shareable and reusable but requires minor revisions:* No changes will be needed to meet the immediate needs of the client for this set of data, but not generalized OR Small changes needed to meet the generalized needs of the client.

*Share-able or re-usable:* The tool not only works for the immediate solution, but it would be easy for others to modify and use in similar situations. OR The solution goes above and beyond meeting the immediate needs of the client.

**IMPLEMENTING AN MEA WITH STUDENTS FOR THE FIRST TIME**
You may want to let students know the following about MEAs:

- MEAs are longer problems; there are no immediate answers. Instead, students should expect to work on the problem and gradually
revise their solution over a period of 45 minutes to an hour.

- MEAs often have more than one solution or one way of thinking about the problem.
- Let the students know ahead of time that they will be presenting their solutions to the class. Tell them to prepare for a 3-5 minute presentation, and that they may use overhead transparencies or other visuals during their presentation.
- Let the students know that you won’t be answering questions such as “Is this the right way to do it?” or “Are we done yet?” You can tell them that you will answer clarification questions, but that you will not guide them through the MEA.
- Remind students to make sure that they have returned to the problem statement to verify that they have fully answered the question.
- If students struggle with writing the letter, encourage them to read the letter out loud to each other. This usually helps them identify omissions and errors.

OBSERVING STUDENTS AS THEY WORK ON THE ALUMINUM BATS MEA
You may find the Observation Form (page 11) useful for making notes about one or more of your teams of students as they work on the MEA. We have found that the form could be filled out “real-time” as you observe the students working or sometime shortly after you observe the students. The form can be used to record observations about what concepts the students are using, how they are interacting as a team, how they are organizing the data, what tools they use, what revisions to their solutions they may make, and any other miscellaneous comments.

PRESENTATION FORM (Optional)
As the teams of students present their solutions to the class, you may find it helpful to have each student complete the presentation form on page 12. This form asks students to evaluate and provide feedback about the solutions of at least two teams. It also asks students to consider how they would revise their own solution to the Aluminum Bats MEA after hearing of the other teams’ solutions.

STUDENT REFLECTION FORM
The Student Reflection Form (page 13) is a useful way for concluding the MEA with the students. The form is a debriefing tool, and it asks students to consider the concepts that they used in solving the MEA and to consider how they would revise their previous solution after hearing of all the different solutions presented by the various teams. Students typically fill out this form after the team presentations.

Follow-up Activities (Optional)
Included are several follow-up activities that may extend the activity beyond the MEA. First, the Model extension Activity on page 10 allows students to think through another situation in a catering kitchen in which scheduling becomes important. It also serves the purpose of allowing students to prepare for the actual creation of the meal in the classroom with the second follow-up activity included. You will find student planning sheets and recipes included in the teaching materials on pages 14-26.

STANDARDS ADDRESSED
Common Core Math Standards

3.0.A.8 Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding

6.RP. Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.” “For every vote candidate A received, candidate C received nearly three votes.”

7.RP Recognize and represent proportional relationships between quantities.
a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.
b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
c. Represent proportional relationships by equations. For example, if total cost \( t \) is proportional to the number \( n \) of items purchased at a constant price \( p \), the relationship between the total cost and the number of items can be expressed as \( t = pn \).

**Standards for Mathematical Practices**

<table>
<thead>
<tr>
<th>Mathematical Practice</th>
<th>How it occurs in MEAs</th>
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<tbody>
<tr>
<td>1. Make sense of problems and persevere in solving them.</td>
<td>As participants work through iterations of their models they continue to gain new insights into ways to use mathematics to develop their models. The structure of MEAs allows for participants to stay engaged and to have sustained problem solving experiences.</td>
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<td>2. Reason abstractly and quantitatively</td>
<td>MEAs allow participants to both contextualize, by focusing on the real world context of the situation, and decontextualize by representing a situation symbolically.</td>
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<td>3. Construct viable arguments and critique the reasoning of others.</td>
<td>Throughout MEAs while groups are working and presenting their models.</td>
</tr>
<tr>
<td>4. Model with mathematics.</td>
<td>This is the essential focus of MEAs; for participants to apply the mathematics that they know to solve problems in everyday life, society, or the workplace. This is done through iterative cycles of model construction, evaluation, and revision.</td>
</tr>
<tr>
<td>5. Use appropriate tools strategically.</td>
<td>Materials are made available for groups as they work on MEAs including graph paper, graphing calculators, computers, applets, dynamic software, spreadsheets, and measuring devices.</td>
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<tr>
<td>6. Attend to precision.</td>
<td>Precise communication is essential in MEAs and participants develop the ability to communicate their mathematical understanding through different representations including written, verbal, symbolic, graphical, pictorial, concrete, and realistic.</td>
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<tr>
<td>7. Look for and make use of structure.</td>
<td>Participants in MEAs can use their knowledge of mathematical properties and algebraic expressions to develop their solutions.</td>
</tr>
<tr>
<td>8. Look for and express regularity in repeated reasoning.</td>
<td>As participants develop their models the patterns they notice can assist in their model development.</td>
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International Dinner Party for Today’s Busy Families

Each year, the Thompson’s have an annual dinner party featuring one world region or country. Last year, they featured traditional French cuisine. This year, they are going to focus on an African country: Morocco. A hostess in Morocco might take a week to prepare a suitable dinner for her honored guests. The meal often consists of as many as fifty courses. It would take a full day just to make Bstilla- a crisp pastry, rolled as thin as tissue paper, filled with chicken in a mixture "sweet and peppery, soft and violent."

Food and Family Caterers specializes in providing food for family gatherings, holidays, and other parties. Many families these days are too busy in the days before a big party to shop and get things ready. Also, they would like to spend more time enjoying the company of their guests rather than cooking in a hot kitchen. Food and Family has made things very simple and can help out on a variety of levels. They can provide everything for the whole meal hot and ready at your door on the day of the event or you can pick up dishes the day before to heat up yourself. They have a wide variety of dishes available including all the standard holiday favorites like mashed potatoes, stuffing, vegetables, pies and turkey. They also have some new items that your family might like to make a new holiday tradition including many vegetarian dishes and low-fat, low-cholesterol dishes for the health conscious. In addition, they have a wide variety of international dishes, like those that the Thompson’s plan to order for their 15 guests.

Food and Family also has cooks they can send to your home to take care of everything while you relax and visit with friends and family. “It takes a lot of planning and organization to make sure we can satisfy our customers, but making people happy makes it worth it,” said Jane Christie, owner of Food and Family Caterers.

Food and Family Caterers does catering service year round and is available for holiday parties, New Year’s Eve parties, and any other celebration where you might like a little help with the food. They can cater for 4 to 400 people. They also work with other local businesses like Eva’s Flowers and the Joanne’s Party and Gift so you can complete your event with flowers, decorations and other party needs.
Readiness Questions
1. How many people are expected to have dinner at the Thompson’s house?

2. Why did the Thompson family decide to use a catering service for this party?

3. What kinds of food does the catering service offer?

4. What other reasons might someone hire a catering service to bring in food?

5. When are other times there might be a lot of people eating dinner together?
The Problem
Mrs. Thompson is trying to host about 15 people for her Moroccan dinner. Since this meal is so extensive and she doesn’t have the necessary time to make it, she has hired the caterers to do the work. They will come to the house to cook everything, but they have some other dinners to prepare that day so they need to keep a tight schedule or they will be late for the next job. They will send 2 people to the house to fix dinner.

Construct a schedule and plan that will enable the caterers to finish all of the food by 6:20 so the Thompson’s can eat by 6:30. This plan should include the following components:

- When to arrive and begin cooking
- When to start each dish
- Which person will work on each dish
- What temperature to set each oven
- Which oven or burner to use for each dish
- Make sure to take into consideration how many pans will fit on each rack of the oven.

Secondly, the managers at the catering company have asked you to help them create a manual for making these decisions in the future. Write a letter to the managers, describing how you created your schedule so the caterers can create a new schedule for another big dinner party.

The table on the following page shows the dishes that need to be prepared, how many of each dish will be made, how long it takes to prepare the dish, how the dish is cooked and at what temperature, and how long it takes to cook. Note that some items don’t need to be cooked (for example Melon a la Morocaine) so there is no cook time, just time for preparation. Also, some dishes need to be hot when they are served.

The Thompson’s have two ovens, four burners on the stovetop, and a microwave. Each oven has two racks each, which are 22” wide and 18” deep. Standard pan sizes are shown below. The four burners can each accommodate one pot at a time. However, two of the burners are smaller than the others and so cooking times may be longer on these two burners. The two larger burners are 10” in diameter, while the two smaller burners are each 7” in diameter.

Cookie sheets: 12” x 18” or 18” x 22”
Baking pans: 8” x 8”, 9” x 9”, 9” x 13”
Skillets: 8”, 9”, 10”, or 12” in diameter
<table>
<thead>
<tr>
<th>Dish</th>
<th># of Batches</th>
<th>Size of Pan Needed</th>
<th>Time to Prepare Each Batch</th>
<th>How to Cook</th>
<th>Temp. for Recipe</th>
<th>Time to Cook</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kebob Koutbane</td>
<td>2</td>
<td>8 x 10 baking dish</td>
<td>30 minutes + 4 hours marinade</td>
<td>Oven</td>
<td>Broil</td>
<td>30 minutes</td>
</tr>
<tr>
<td>Couscous Marrakesh</td>
<td>1</td>
<td>6 quart pot</td>
<td>45 minutes</td>
<td>Stovetop</td>
<td>High</td>
<td>1.5 hours</td>
</tr>
<tr>
<td>Khubz (flat bread)</td>
<td>2 pans</td>
<td>Cookie sheet</td>
<td>20 minutes + 3 hrs to rise</td>
<td>Oven</td>
<td>500°</td>
<td>5-8 minutes</td>
</tr>
<tr>
<td>Batinjaan Zalud (Eggplant Salad)</td>
<td>2</td>
<td>10” skillet</td>
<td>30 minutes</td>
<td>Stovetop/Refrigerator</td>
<td>High</td>
<td>10 minutes + 2 hrs to chill</td>
</tr>
<tr>
<td>Moroccan Coconut Cakes</td>
<td>2 pans</td>
<td>2 quart saucepan</td>
<td>10 minutes</td>
<td>Stovetop/Refrigerator</td>
<td>Heat to 238°</td>
<td>10 minutes + 3 hrs to chill</td>
</tr>
<tr>
<td>Melon a la Morocaine</td>
<td>2 dishes</td>
<td>None</td>
<td>15 minutes</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Peasant Pancakes</td>
<td>2 pans</td>
<td>9” skillet</td>
<td>20 minutes</td>
<td>Stovetop</td>
<td>High</td>
<td>30 minutes</td>
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<tr>
<td>Roast Lamb and Carrots with Chickpea Puree</td>
<td>2 batches</td>
<td>Cookie sheet</td>
<td>25 minutes</td>
<td>Oven</td>
<td>450°</td>
<td>15 – 20 minutes</td>
</tr>
<tr>
<td>Pomegranate-glazed carrots</td>
<td>2 batches</td>
<td>10” skillet</td>
<td>15 minutes</td>
<td>Stovetop</td>
<td>Moderate Heat</td>
<td>30 minutes</td>
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<tr>
<td>Roasted Beets with Cumin</td>
<td>1 pan</td>
<td>Cookie sheet</td>
<td>15 minutes</td>
<td>Oven</td>
<td>425°</td>
<td>1.5 hours</td>
</tr>
<tr>
<td>Mint Tea</td>
<td>2 pots</td>
<td>Teapot</td>
<td>5 minutes</td>
<td>Stovetop</td>
<td>High</td>
<td>5 minutes</td>
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Model Extension Activity – International Foods MEA

Another catering company, Alice’s Kitchen, has received a similar job, and has agreed to prepare a similar meal with similar cooking times. However, unlike Food and Family Caterers, they are preparing the meal in their catering kitchens and then delivering the meal to the family who has hired them.

They have 29 staff members, with 5 independent kitchens. Each kitchen is equipped with a microwave, an oven, and a 4-burner stove. They have 4 other meals to prepare that day, so they need to make the meal in as short a time as possible so that the five kitchens can be used for creating the other meals. The manager must determine the best way to divide up the recipes among the staff so that the meal can be prepared in the least amount of total time and so that each staff member has an equitable amount of work.

Using the recipe information from the previous problem, design a plan that she could use.
OBSERVATION FORM FOR TEACHER - International Foods MEA

Team: ____________________________

STEM (Science, Technology, Engineering, & Mathematics) Concepts Used:
What STEM concepts and skills did the students use to solve the problem?

Team Interactions:
How did the students interact within their team or share insights with each other?

Data Organization & Problem Perspective:
How did the students organize the problem data? How did the students interpret the task? What perspective did they take?

Tools:
What tools did the students use? How did they use these tools?

Miscellaneous Comments about the team functionality or the problem:

Cycles of Assessment & Justification:
How did the students question their problem-solving processes and their results? How did they justify their assumptions and results? What cycles did they go through?
PRESENTATION FORM – International Foods MEA

Name__________________________________

While the presentations are happening, choose TWO teams to evaluate. Look for things that you like about their solution and/or things that you would change in their solution. You are not evaluating their style of presenting. For example, don’t write, “They should have organized their presentation better.” Evaluate their solution only.

Team ________________________________

What I liked about their solution:

What I didn’t like about their solution:

Team ________________________________

What I liked about their solution:

What I didn’t like about their solution:

After seeing the other presentations, how would you change your solution? If you would not change your solution, give reasons why your solution does not need changes.
STUDENT REFLECTION FORM – International Foods MEA

Name __________________________ Date __________________________

1. What mathematical or scientific concepts and skills (e.g. ratios, proportions, forces, etc.) did you use to solve this problem?

2. How well did you understand the concepts you used?

Not at all     A little bit     Some     Most of it     All of it

Explain your choice:

3. How well did your team work together? How could you improve your teamwork?

4. Did this activity change how you think about mathematics?
**Kitchen Planning Form – International Foods MEA**

For students’ use in planning the kitchen tasks and ordering food to actually complete the meal.

Names: __________________________  Hour: ________________

_______________________________  Name of Food: __________________________

_______________________________  Serving Time: __________________________

_______________________________  Begin Clean Up Time: ________________

_______________________________  End Clean Up Time: ________________

Preparation to do day ahead (if any): List the job and who will do it.
1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________

Preparation to do the day of lab: List the job and who will do it.
1. ____________________________
2. ____________________________
3. ____________________________
4. ____________________________
5. ____________________________

Clean Up (Both Days if Needed):
1. Wash dishes, wipe and dry sink: ____________________________
2. Dry dishes, wipe cupboards ____________________________
3. Put away dishes, wipe and dry range: ____________________________
4. Wipe counters, sink, and tables, sweep floor ____________________________
5. Written work: evaluation, costs ____________________________
## Kitchen Planning Form – International Foods MEA

### Market Order

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
<th>Cost</th>
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</table>

**Total Cost of Supplies:**

**Cost per person:**
Additional Resources – Recipes - International Foods MEA

POMEGRANATE-GLAZED CARROTS

The ubiquity of pomegranates in Morocco inspired food editor Maggie Ruggiero to add one nontraditional ingredient — pomegranate juice — to this very traditional meze; its tartness turns up the volume on all the flavors, and its color lends a beautiful mahogany sheen.

Active time: 15 min
Start to finish: 45 min
Servings: Makes 6 servings.

Ingredients

1 tablespoon olive oil
1 pound carrots, cut diagonally into 1/4-inch-thick slices
1 cup pomegranate juice
1 (3-inch) cinnamon stick
1/2 teaspoon salt
1/8 teaspoon black pepper
3/4 teaspoon coriander seeds, toasted and lightly crushed

Preparation

Heat oil in a 10-inch heavy skillet over moderate heat until hot but not smoking. Add carrots and sauté, stirring occasionally, 5 minutes. Add pomegranate juice, cinnamon stick, salt, and pepper and simmer, uncovered, stirring occasionally, until carrots are tender and liquid is reduced to a glaze, 20 to 25 minutes. Add coriander seeds and cook, stirring, 1 minute. Discard cinnamon stick and serve carrots hot or at room temperature.
ROASTED BEETS WITH CUMIN AND MINT

Moroccan hospitality, always gracious, begins with mezes, the enticing little dishes set out to welcome guests before the meal. Cumin and mint are a classic combination, and they work particularly well with roasted beets — the cumin underlines their earthiness, and the mint freshens their undeniable sweetness.

Active time: 15 min
Start to finish: 1 3/4 hour
Servings: Makes 6 servings.

Ingredients

1 tablespoon fresh lemon juice
1 teaspoon cumin seeds, toasted and lightly crushed
1/2 teaspoon salt
1/4 teaspoon black pepper
2 tablespoons extra-virgin olive oil
3 medium beets (1 1/4 pound total without greens), trimmed, leaving 1 inch of stems attached
1/3 cup fresh mint, coarsely chopped

Preparation

Stir together lemon juice, cumin seeds, salt, and pepper in a medium bowl. Stir in oil and let stand while roasting beets.

Put oven rack in middle position and preheat oven to 425°F.

Tightly wrap beets in a double layer of foil and roast on a baking sheet until tender, 1 to 1 1/4 hours. Cool to warm in foil package, about 20 minutes.

When beets are cool enough to handle, peel them, discarding stems and root ends, then cut into 1/2-inch-wide wedges.

Toss warm beets with dressing. Stir in mint just before serving.

Cooks’ note: Beets can be roasted and tossed with dressing 4 hours ahead, then kept, covered, at room temperature.
Moroccan-style lamb and carrots with chickpea purée

Il Vino d’Enrico Bernardo, a wine-centric Paris restaurant, features a delicious dish of lamb chops, carrots, and chickpeas with North African spices and black truffles. Skipping the truffles makes it more everyday, but it’s still wonderful.

Active time: 20 min Start to finish: 35 min

Servings: Makes 4 servings

Ingredients for lamb chops and carrots:
- 1/4 cup olive oil
- 1 teaspoon ground allspice
- 1/2 teaspoon cinnamon
- 1/4 teaspoon cayenne
- 6 medium carrots, halved crosswise and quartered lengthwise
- 8 to 12 rib lamb chops (1/4 to 1/2 inch thick; 1 1/2 pounds total)

Preparation

Roast lamb chops and carrots:

Put a 4-sided sheet pan in lower third of oven and preheat oven to 450°F.

Whisk together oil, spices, and 1 teaspoon salt. Toss carrots with half of spiced oil and coat chops with remaining oil. Arrange chops and carrots side by side in hot sheet pan. Roast, turning and stirring halfway through, until carrots are just tender and chops are medium-rare, 4 to 6 minutes total for lamb; 10 to 15 for carrots.

Meanwhile, make chickpea purée:

With food processor running, drop garlic through feed tube to finely chop. Add chickpeas, water, cumin, and 1/4 teaspoon salt and purée. With motor running, slowly add oil and blend until smooth.

Serve lamb and carrots on a bed of chickpea purée. Drizzle with pan juices.
KEBAB KOUTBANE

Appetizer Kebabs in a Moorish Marinade

Yield: 8 6-inch kebabs

This typically Moroccan dish is an excellent hors d’oeuvre to serve at any time. It is amazing how the small cubes of suet improve the flavor of the kebab after some of the fat has burned off. The use of suet is particularly effective when cooking kebabs over a charcoal fire and may be successfully substituted in recipes calling for bacon.

Cut 1 lb. FILLET OF BEEF OR STEAK into 3/4-inch cubes (approximately 32 cubes).

Cut 1/2 lb. BEEF SUET into 1/2-inch cubes.

In an 8 x 10-inch shallow baking dish, prepare the Moorish Marinade:

Combine: 1/4 cup ONION, finely chopped and
2 Tbs. PARSLEY, finely chopped.

Blend: 1/2 cup OLIVE or SALAD OIL
1 tsp. SALT
1/4 tsp. PEPPER
1/4 tsp. GARLIC POWDER
1 tsp. GROUND CORIANDER (optional)
1/2 tsp. GROUND CUMIN (optional).

Blend the beef and suet cubes with the marinade and allow the mixture to marinate for several hours.

Thread four pieces of beef alternately with three pieces of suet (start and end with beef) on a 6-inch metal or bamboo skewer.

Grill or Broil using a hot fire, basting occasionally with the marinade.

Arrange 1 KEBAB KOUTBANE on a small plate.

Garnish with TOMATO SLICES and PARSLEY SPRIGS at the side of the plate.
COUSCOUS MARRAKESH

Yield: 8 portions

A couscousiere is a large double boiler with holes in the bottom of the upper pot allowing its contents to steam. A couscousiere may be improvised by lining a metal colander with cheese cloth and placing the colander in a 6- or 8-quart pot so that the handles rest on the rim. A piece of heavy-duty foil can serve as a lid.

Moisten: 1 lb. COUSCOUS in a 3 quart bowl with 1 cup COLD WATER to which 1 Tbs. SALT has been added.
Stir up with a fork and allow to stand 10 minutes to swell.

Spread the Couscous out in a colander lined with cheese cloth (or in the top of a couscousiere).
Place the colander over a pan which fits it and is half filled with water.

Cover with aluminum foil and allow to steam for 10 minutes.

In a 6-quart kettle (or bottom of couscousiere):
Saute: 1 cup ONIONS coarsely chopped with 1 tsp. CORIANDER (powdered)
1 Tbs. SALT
1 tsp. CRUSHED RED PEPPER
1/2 tsp. SAFFRON
1 tsp. POWDERED CUMIN SEED in
1/4 cup PEANUT OIL until soft but not brown.

Add: 2 1/2 lbs. BONELESS LAMB cut in 2 inch chunks and
2 quarts WATER.

Add 1 3-lb. CHICKEN cut into 8 pieces to the stew and continue cooking for 30 minutes longer.
Stir the Couscous from time to time to make sure the grains are separated.

Add to Stew: 1 lb. CARROTS, scraped and cut in 1-inch chunks
2 GREEN PEPPERS, cut in 1/2-inch strips
1 lb. FRESH TOMATOES, cut in 1-inch wedges
1 lb. YELLOW SQUASH, peeled and cut in 2-inch slices
12 oz. FROZEN STRING BEANS (regular cut) or PEAS
1 # 2 1/2 can CHICK PEAS, drained
1/2 lb. BLACK RAISINS.

Correct the seasoning with salt and pepper.
Cook for about 15 minutes or until vegetables are soft but still slightly crisp.

Pour the Couscous into a large (15- to 18 inch) round serving platter.

Make a large hole in the center, pushing the Couscous to the edge of platter.

Arrange meat and vegetables attractively in center, pouring the sauce over all.

Garnish with PARSLEY SPRIGS.
01/09/2009

Batinjaan Zalud (Eggplant Salad)

Yield: 8 small salads

This Eggplant Salad may also be served as an appetizer. It is an excellent accompaniment to a Couscous, as it is to any of the great entrees of Morocco. Be sure that the salad is very cold when served.

Peel 1 or 2 large EGGPLANTS (approx. 2 lbs.).
Cut into 1-inch slices.
In a 10-inch skillet:
Fry in 1/2 cup OLIVE or SALAD OIL until soft.
Mash the eggplant.
Add: 1/4 cup ONION finely chopped
3 cloves GARLIC finely chopped (or 1 tsp. garlic powder)
4 Tbs. LEMON JUICE
1 tsp. SALT
1/4 tsp. GROUND PEPPER
1 Tbs. SUGAR, and blend thoroughly.

Chill in refrigerator.

Heap 1/2 cup EGGPLANT MIXTURE on a 6- to 7-inch plate.
Mash it down to form a circle within 1 inch of edge of plate.
Dribble with 1/2 tsp. OLIVE OIL (if mixture appears dry).
Place:
1 slice TOMATO in center of circle and
1 BLACK OLIVE in center of tomato.

Garnish with PARSLEY SPRIGS.
MINT TEA

Yield: 8 servings

Into a 6 cup glass or china teapot:

Pour boiling water, rinse and throw the water away.

Put in: 3 heaping Tbs. OOLONG TEA (do not use teabags)

2 heaping Tbs. DRIED MINT LEAVES

1/2 cup SUGAR.

Fill the teapot to the brim with BOILING WATER.

Allow to steep covered for 5 minutes.

Stir up the infusion and taste the liquid to see if it is sweet enough.

Strain into juice glasses (5 to 6 oz.).

Note: Prepare second infusion while the guests are enjoying the first. Add 1 tsp. tea, 1 tsp. mint and 2 Tbs. sugar to the pot. Add boiling water to allow to steep for 5 minutes. Stir again. Taste for sweetness. Strain to serve.