LECTURES

A Faculty Development Session or Resident as Teacher Session for Didactic and Clinical Teaching Techniques; Part 1 of 2: Engaging Learners with Effective Didactic Teaching

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ABSTRACT:

Audience: This workshop is intended for faculty members in an emergency medicine (or other) residency program, but is also appropriate for chief residents and medical student educators, including basic science faculty.

Introduction: Faculty development sessions are required by the Accreditation Council for Graduate Medical Education and enhance the learning environment within residency programs.[1] Resident as teacher sessions are important in helping residents transition from junior learners to supervisors of medical students and junior residents. Part one of this two-part workshop introduces learners to effective techniques to engaging learners during didactic sessions.

Objectives: By the end of this didactic session, the learner will: 1) describe eight teaching techniques that encourage active learning during didactic sessions; 2) plan a didactic session using at least one of eight new teaching techniques for didactic instruction.

Methods: This educational session is uses several blended instructional methods, including team-based learning (classic and modified), the flipped classroom, audience response systems, pause procedures in order to demonstrate effective didactic teaching techniques.

Topics: Faculty development, didactics, residency conference, pause procedures, commitment activities, team-based learning, small group learning, jigsaw, problem based learning, think pair share, one minute paper, the muddiest point, audience response systems.

USER GUIDE

List of Resources:

Learner Audience:
Senior Residents and faculty

Time Required for Implementation:
Instructor Preparation: 30 minutes
Learner Responsible Content: 15 minutes
In Class Portion: 60 minutes

Topics:
Faculty development, didactics, residency conference, pause procedures, commitment activities, team based learning, small group learning, jigsaw, problem based learning, think pair share, one minute paper, the muddiest point, audience response systems.

Recommended Number of Learners per Instructor:
This faculty development session has been tested on groups of 20 to 80 faculty members. This session could be successful with as few as three faculty members or as many as 100 faculty members.

Objectives:
By the end of this didactic session, learners will:

1. Describe eight teaching techniques that encourage active learning during didactic sessions.
2. Plan a didactic session using at least one of eight new teaching techniques for didactic instruction

Linked objectives and methods:
This faculty development session utilizes several blended learning techniques in order to engage the audience, as well as to demonstrate the teaching strategies taught in this presentation. Learners are asked to complete a reading assignment prior to the faculty development session. This "flipped classroom" method of instruction, promotes active learning and demonstrates a teaching strategy for your learners.[2] The readiness assurance process ensures that the learner "knows" the material (objective 1). The group application exercise demonstrates that the learner "knows how" to apply the material. Finally, the learners that ultimately use the techniques in didactic or clinical teaching exhibit a "does" level of behavior. The techniques taught by this session are fully integrated into the session. Participants are able to learn about the teaching techniques, while experiencing them. The learners are taught team-based learning (TBL) by participating in a brief team-based learning exercise. Furthermore, they are taught multiple other concepts, such as commitment activities and pause procedures (such as think-pair-share and one-minute paper) through demonstration. Finally, learners plan a didactic session during the final group application exercise using many of these techniques (objective 2). Having participated in each technique as a learner and implemented many techniques during the final group application exercise, faculty members may then feel more comfortable to use each of these techniques.

Recommended pre-reading for instructor:

- Wolff M, Wagner MJ, Poznanski S, Schiller J, Santen S. Not just another boring lecture: engaging learners with active learning techniques. *J Emerg Med.* 2015;48(1):85-93.

Learner responsible content (LRC):

- Wolff M, Wagner MJ, Poznanski S, Schiller J, Santen S. Not just another boring lecture: engaging learners with active learning techniques. *J Emerg Med.* 2015;48(1):85-93.
- During session, learners will also read: http://www.finecooking.com/item/55415/the-science-of-baking-cookies

Tips for successful implementation:
This is a two-part faculty development session. Part one focuses on didactics and part two focuses on clinical teaching. Each part will take approximately 60 minutes. Both sessions can be performed in a single day, or the two parts can be separated temporally. Please refer to the presenter's notes within PowerPoint for a sample discussion.

Prepare:

1. Place audience response system slides from pollev.com to replace the placeholders in the PowerPoint file (optional)
2. Read and instruct learners to read the following article at least a few days in advance of the session: Wolff M, Wagner MJ, Poznanski S, Schiller J, Santen S. Not just

another boring lecture: Engaging learners with active learning techniques. *J Emerg Med.* 2015;48(1):85-93.

3. Prepare the cookie gRATs by making it an IF/AT (immediate feedback/assessment technique). You will need to buy scratch off stickers (www.amazon.com) to prepare a gRAT-IF/AT for each group. Place the scratch off stickers over the letters choices on the gRAT. During the exercise, groups will scratch off their answer choice and get immediate feedback as to whether they got the right answer.
4. (Optional) Automatically tweet during your session by activating auto-tweets. Tweets are already populated into the PowerPoint. If you do not have auto-tweet software on your computer, this will not affect your presentation.

Also prepare:

1. One copy of team numbers (one number per team)
2. One copy of didactics iRAT for each learner
3. One copy of didactics gRAT for each team (4-5 learners per team)
4. One copy of didactics RAT key for the instructor
5. One copy of cookie pre-reading (http://www.finecooking.com/item/55415/the-science-of-baking-cookies)[3] for each learner
6. One copy of cookie iRAT for each learner
7. One copy of cookie gRAT for each team
8. One copy of cookie GAE for each team
9. One copy of cookie GAE key for the instructor
10. One copy of didactic GAE for each team

Implementation:

1. Session is best implemented in round tables with 4-5 learners per table
2. Each table (group) will need the following: a team number, 4-5 iRATs (didactics), 1 gRAT (didactics), 4-5 cookie iRATs, 1 cookie gRAT, 1 cookie GAE, 1 group application exercise
3. Start by giving PowerPoint presentation (Didactic teaching – part 1), sample discussion points are in the presenter notes of the PowerPoint file.
4. On slide 9, you will instruct learners to complete the iRAT.
5. On slide 10, you will place learners into groups of 4-5 people.
6. Beginning on slide 11, you will call on teams at random (by their team number) and have them answer each of the questions on the RATs.
7. On slide 35, you will start the cookie TBL. Have learners read the cookie pre-reading, then complete the cookie iRAT (slide 36). Then, have them reconvene in their groups to complete the cookie gRAT (slide 37). Introduce the concept of an IF/AT and instruct them how to scratch off the answers (only scratch off which answer they think is correct). Then groups will complete the group application exercise (slide 38). Go over the answers for the group application exercise.
8. On slide 40, you will continue going over the questions from the first iRAT and then continue to go through the remaining slides.
9. On slide 54, you will hand out the final group application exercise. Ask groups to prepare a didactic session using the techniques you have discussed. They can choose a topic, or you can suggest one, such as "pediatric limp" or "acute angle closure glaucoma."
10. On slide 55, summarize all of the techniques you have discussed.

Results:

This faculty development session has been implemented in the following venues:

1. A faculty development session for 20 emergency department faculty members. The session was rated as 4.62/5 overall (1: poor; 2: fair; 3: average; 4: good; 5: outstanding) and 2.92/3 for usefulness (1: not very useful; 2: somewhat useful; 3: extremely useful).
2. A faculty development session for 80 multi-specialty faculty in various positions in graduate and undergraduate medical education. We received outstanding verbal feedback for this session)
3. A national meeting pre-conference with 25 attendees. Attendees were a mix of emergency medicine faculty members and chief residents.
4. Two new faculty orientations for new faculty members from all specialties.

Content:

1. **Lecture slides:** Please see the attached PowerPoint for the lecture slides.

2. **Individual Readiness Assessment Test (iRAT):**
   There are two iRATs for this session:
   Didactic iRAT
   Cookie iRAT

3. **Group Readiness Assessment Test (gRAT):**
   There are two gRATs for this session
   Didactic gRAT
   Cookie gRAT

4. **RAT Key:**
   Didactic RAT key: Please see attached file
   Cookie RAT key

5. **Group Application Exercise (GAE):**
   Didactic GAE

USER GUIDE

Cookie GAE
Cookie GAE key

Brief Wrap Up: Please use the PowerPoint and the above "tips for successful implementation" to guide you through the entire session.

Technology necessary: PowerPoint and the session is best run using an audience response system.

Assessment: The didactic iRAT, gRAT, and group application exercises may be used as assessment tools, if desired.

References/suggestions for further reading:

1. Accreditation Council for Graduate Medical Education. ACGME Program Requirements for Graduate Medical Education in Emergency Medicine, 2013. http://www.acgme.org/acgmeweb/portals/0/pfassets/2013-pr-faq-pif/110_emergency_medicine_07012013.pdf. Accessed September 12, 2015.
2. Moraros J, Islam A, Yu S, Banow R, Schindelka B. Flipping for success: evaluating the effectiveness of a novel teaching approach in a graduate level setting. *BMC Med Educ.* 2015;15:27. doi: 10.1186/s12909-015-0317-2.
3. Wolff M, Wagner MJ, Poznanski S, Schiller J, Santen S. Not just another boring lecture: Engaging learners with active learning techniques. *J Emerg Med.* 2015;48(1):85-93. doi: 10.1016/j.emermed.2014.09.010
4. Joachim D, Schloss A. The science of baking cookies. http://www.finecooking.com/item/55415/the-science-of-baking-cookies. Published October 29, 2013. Accessed June 8. 2016.

LEARNER MATERIALS

Didactic iRAT

Match the following teaching techniques with their description.

Think-Pair-Share	Small-group sessions	Jigsaw
Pause Procedures	Problem-based learning	Commitment activities
Team-based learning	Case-based learning	

	Exercises that force learners to make a decision. Can be done individually, in pairs or groups.
	A technique that uses clinical vignettes of real or hypothetical patients to facilitate discussion.
	Case-based learning in small groups.
	A technique that increases interaction and allows learners the opportunity to participate more readily.
	Small-group learning that involves pre-class preparation so that learners are ready to learn. This is followed by a classroom portion where learners are tested on the pre-class material and then challenged to apply core content to scenarios as a team.
	A topic is divided into several smaller, interrelated parts. Each member of the team is assigned to read and become an expert on part of the topic. After each person has become an expert, they teach their team members about their piece. After each person in the group is finished teaching their portion, the puzzle is assembled.
	Pose a question to the group and have learners consider their response individually. Next, instruct learners to partner with a neighbor to compare responses and reach consensus. End by randomly calling on groups to give their answers.
	A brief break in a learning session to allow learning to allow learners to clarify and assimilate information. Examples: One-minute paper and the muddiest point

Adapted from: Wolff M, Wagner MJ, Poznanski S, Schiller J, and Santen S. Not just another boring lecture: Engaging learners with active learning techniques. J Emerg Med 2015. 48(1):85-93

LEARNER MATERIALS

Didactic gRAT

Match the following teaching techniques with their description.

Think-Pair-Share	Small-group sessions	Jigsaw
Pause Procedures	Problem-based learning	Commitment activities
Team-based learning	Case-based learning	

	Exercises that force learners to make a decision. Can be done individually, in pairs or groups.
	A technique that uses clinical vignettes of real or hypothetical patients to facilitate discussion.
	Case-based learning in small groups.
	A technique that increases interaction and allows learners the opportunity to participate more readily.
	Small-group learning that involves pre-class preparation so that learners are ready to learn. This is followed by a classroom portion where learners are tested on the pre-class material and then challenged to apply core content to scenarios as a team.
	A topic is divided into several smaller, interrelated parts. Each member of the team is assigned to read and become an expert on part of the topic. After each person has become an expert, they teach their team members about their piece. After each person in the group is finished teaching their portion, the puzzle is assembled.
	Pose a question to the group and have learners consider their response individually. Next, instruct learners to partner with a neighbor to compare responses and reach consensus. End by randomly calling on groups to give their answers.
	A brief break in a learning session to allow learning to allow learners to clarify and assimilate information. Examples: One-minute paper and the muddiest point

Adapted from: Wolff M, Wagner MJ, Poznanski S, Schiller J, and Santen S. Not just another boring lecture: Engaging learners with active learning techniques. J Emerg Med 2015. 48(1):85-93

LEARNER MATERIALS

Didactic Group Application Exercise

You are asked to teach a didactic session to your PGY-1 through PGY-3 residents. The topic of the didactic session is:

_____

_____

Please develop the following:

1. Content of the session
   What would you like to cover during the session?
   a.

   b.

   c.

   d.

2. Goals and objectives for the didactic session
   By the end of this session, the resident will:
   a.

   b.

   c.

3. Which teaching strategies will you use to deliver the content?
   Examples: Pause procedures, jigsaw, TBL, commitment activities, PBL
   a.

   b.

   c.

   d.

Cookie iRAT

1. Flour helps the cookie hold its shape and changes the consistency of the cookie, which of the following will happen if you add more flour to a cookie recipe?
   a) Crispier, thinner cookies
   b) Softer, more cake-like cookies
   c) Softer, thicker cookies
   d) Crispier, thicker cookies

2. You ran out of baking soda and made a chocolate chip cookie recipe without any, this will result in cookies that are:
   a) Very dark and brown
   b) Very pale
   c) Thick
   d) Flat

3. Why does a chocolate chip cookie recipe calls for salt?
   a) To help mix ingredients
   b) To enhance flavor
   c) To flatten the cookie
   d) To make the cookie crispier

4. In addition to adding a clear buttery flavor, butter has a _____ melting point, contributing _____ cookies.
   a) lower; thicker, chewier
   b) lower; thinner, crispier
   c) higher; thicker, chewier
   d) higher; thinner, crispier

5. Substituting brown sugar for white sugar will result in:
   a) a darker, thinner cookie
   b) a darker, crispier cookie
   c) a moist, chewy cookie

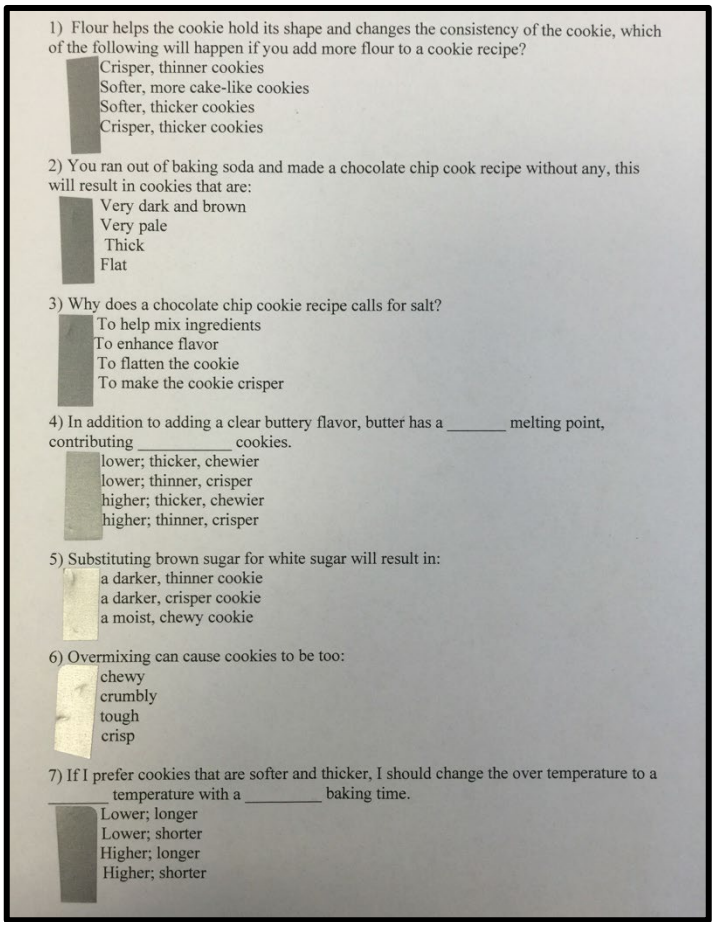
6. Overmixing can cause cookies to be too:
   a) chewy
   b) crumbly
   c) tough
   d) crisp

7. If I prefer cookies that are softer and thicker, I should change the over temperature to a _____ temperature with a _____ baking time.
   a) Lower; longer
   b) Lower; shorter
   c) Higher; longer
   d) Higher; shorter

LEARNER MATERIALS

Cookie gRAT

The subsequent gRAT is intended to be an IF/AT. Ideally, you will purchase "scratch off stickers" (available at amazon.com) and place the stickers over the index letters as shown below (1st photo is the gRAT to be given to the learning team and the 2nd photo is the completed gRAT). If you do not want to create an IF/AT form, you can use the iRAT instead for your gRAT



1) Flour helps the cookie hold its shape and changes the consistency of the cookie, which of the following will happen if you add more flour to a cookie recipe?
Crisper, thinner cookies
Softer, more cake-like cookies
Softer, thicker cookies
Crisper, thicker cookies

2) You ran out of baking soda and made a chocolate chip cook recipe without any, this will result in cookies that are:
Very dark and brown
Very pale
Thick
Flat

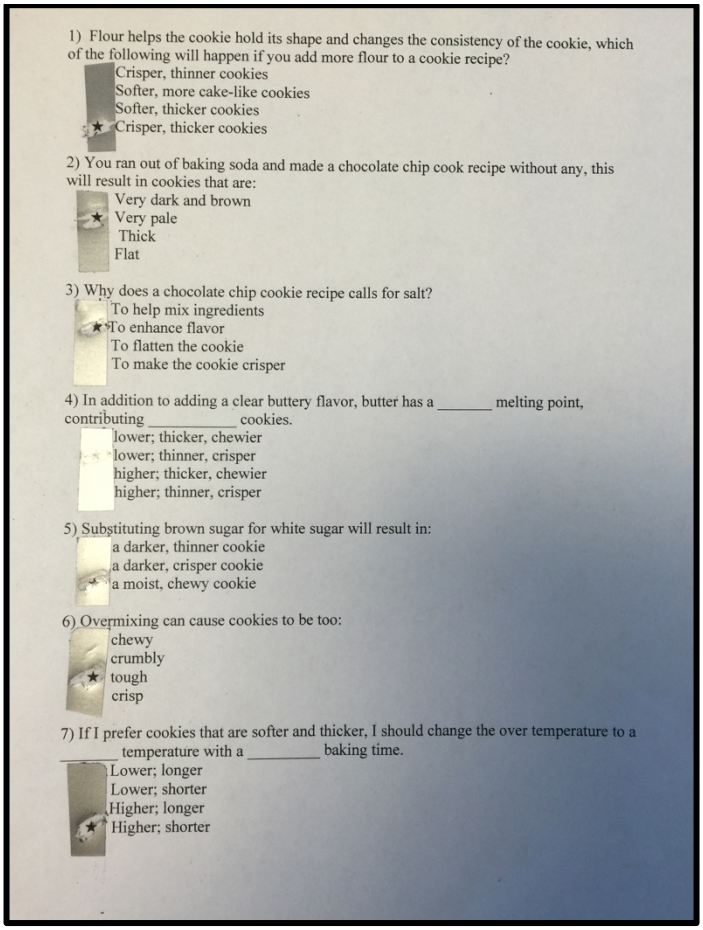
3) Why does a chocolate chip cookie recipe calls for salt?
To help mix ingredients
To enhance flavor
To flatten the cookie
To make the cookie crisper

4) In addition to adding a clear buttery flavor, butter has a _____ melting point, contributing _____ cookies.
lower; thicker, chewier
lower; thinner, crisper
higher; thicker, chewier
higher; thinner, crisper

5) Substituting brown sugar for white sugar will result in:
a darker, thinner cookie
a darker, crisper cookie
a moist, chewy cookie

6) Overmixing can cause cookies to be too:
chewy
crumbly
tough
crisp

7) If I prefer cookies that are softer and thicker, I should change the over temperature to a _____ temperature with a _____ baking time.
Lower; longer
Lower; shorter
Higher; longer
Higher; shorter



1) Flour helps the cookie hold its shape and changes the consistency of the cookie, which of the following will happen if you add more flour to a cookie recipe?
Crisper, thinner cookies
Softer, more cake-like cookies
Softer, thicker cookies
★ Crisper, thicker cookies

2) You ran out of baking soda and made a chocolate chip cook recipe without any, this will result in cookies that are:
Very dark and brown
★ Very pale
Thick
Flat

3) Why does a chocolate chip cookie recipe calls for salt?
To help mix ingredients
★ To enhance flavor
To flatten the cookie
To make the cookie crisper

4) In addition to adding a clear buttery flavor, butter has a _____ melting point, contributing _____ cookies.
lower; thicker, chewier
lower; thinner, crisper
higher; thicker, chewier
higher; thinner, crisper

5) Substituting brown sugar for white sugar will result in:
a darker, thinner cookie
a darker, crisper cookie
a moist, chewy cookie

6) Overmixing can cause cookies to be too:
chewy
crumbly
★ tough
crisp

7) If I prefer cookies that are softer and thicker, I should change the over temperature to a _____ temperature with a _____ baking time.
Lower; longer
Lower; shorter
Higher; longer
★ Higher; shorter

Cookie gRAT

1. Flour helps the cookie hold its shape and changes the consistency of the cookie, which of the following will happen if you add more flour to a cookie recipe?
   a) Crispier, thinner cookies
   b) Softer, more cake-like cookies
   c) Softer, thicker cookies
   ★ Crispier, thicker cookies

2. You ran out of baking soda and made a chocolate chip cookie recipe without any, this will result in cookies that are:
   a) Very dark and brown
   ★ Very pale
   c) Thick
   ★ Flat

3. Why does a chocolate chip cookie recipe calls for salt?
   a) To help mix ingredients
   ★ To enhance flavor
   c) To flatten the cookie
   d) To make the cookie crispier

4. In addition to adding a clear buttery flavor, butter has a _____ melting point, contributing _____ cookies.
   a) lower; thicker, chewier
   ★ lower; thinner, crispier
   c) higher; thicker, chewier
   d) higher; thinner, crispier

5. Substituting brown sugar for white sugar will result in:
   a) a darker, thinner cookie
   b) a darker, crispier cookie
   ★ a moist, chewy cookie

6. Overmixing can cause cookies to be too:
   a) chewy
   b) crumbly
   ★ tough
   d) crisp

7. If I prefer cookies that are softer and thicker, I should change the over temperature to a _____ temperature with a _____ baking time.
   a) Lower; longer
   b) Lower; shorter
   c) Higher; longer
   ★ Higher; shorter

LEARNER MATERIALS

Cookie Group Application Exercise

CHOCOLATE CHIP COOKIE RECIPE

INGREDIENTS

2 cups all-purpose flour
1 teaspoon baking soda
1 teaspoon salt
1 cup (2 sticks) butter, softened
1 cup granulated sugar
3/4 cup packed brown sugar
1 teaspoon vanilla extract
2 large eggs
2 1/2 cups (12-oz. pkg.) Semi-Sweet Chocolate Chips

PREHEAT oven to 375° F.

COMBINE flour, baking soda and salt in small bowl. Beat butter, brown and white sugar, and vanilla. Beat in eggs. Gradually beat in flour mixture. Stir in chocolate chips. Divide and place on baking sheet.

BAKE for 10 minutes or until golden brown.

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1) Discuss ways to edit the ingredient list to create chewier, thicker cookies:

2) What other changes to the recipe (other than ingredients) could help contribute to softer, thicker cookies?

3) Discuss ways to edit the ingredients to create crisper, browner cookies:

INSTRUCTOR MATERIALS

Answer keys to all exercises with explanations, are on the following pages.

Learners: please do not proceed.

INSTRUCTOR MATERIALS

Didactic RAT Key

Commitment activities	Exercises that force learners to make a decision. Can be done individually, in pairs or groups.
Case-based learning	A technique that uses clinical vignettes of real or hypothetical patients to facilitate discussion.
Problem-based learning	Case-based learning in small groups.
Small-group sessions	A technique that increases interaction and allows learners the opportunity to participate more readily.
Team-based learning	Small-group learning that involves pre-class preparation so that learners are ready to learn. This is followed by a classroom portion where learners are tested on the pre-class material and then challenged to apply core content to scenarios as a team.
Jigsaw	A topic is divided into several smaller, interrelated parts. Each member of the team is assigned to read and become an expert on part of the topic. After each person has become an expert, they teach their team members about their piece. After each person in the group is finished teaching their portion, the puzzle is assembled.
Think-Pair-Share	Pose a question to the group and have learners consider their response individually. Next, instruct learners to partner with a neighbor to compare responses and reach consensus. End by randomly calling on groups to give their answers.
Pause Procedure	A brief break in a learning session to allow learning to allow learners to clarify and assimilate information. Examples: One-minute paper and the muddiest point

Adapted from: Wolff M, Wagner MJ, Poznanski S, Schiller J, and Santen S. Not just another boring lecture: Engaging learners with active learning techniques. J Emerg Med 2015. 48(1):85-93.

INSTRUCTOR MATERIALS

Cookie RAT Key

1. Flour helps the cookie hold its shape and changes the consistency of the cookie, which of the following will happen if you add more flour to a cookie recipe?
   d) Crispier, thinner cookies
   e) Softer, more cake-like cookies
   f) Softer, thicker cookies
   ★ Crispier, thicker cookies

2. You ran out of baking soda and made a chocolate chip cookie recipe without any, this will result in cookies that are:
   b) Very dark and brown
   ★ Very pale
   c) Thick
   ★ Flat

3. Why does a chocolate chip cookie recipe calls for salt?
   a) To help mix ingredients
   ★ To enhance flavor
   c) To flatten the cookie
   d) To make the cookie crispier

4. In addition to adding a clear buttery flavor, butter has a _____ melting point, contributing _____ cookies.
   b) lower; thicker, chewier
   ★ lower; thinner, crispier
   c) higher; thicker, chewier
   d) higher; thinner, crispier

5. Substituting brown sugar for white sugar will result in:
   d) a darker, thinner cookie
   e) a darker, crispier cookie
   ★ a moist, chewy cookie

6. Overmixing can cause cookies to be too:
   c) chewy
   d) crumbly
   ★ tough
   d) crisp

7. If I prefer cookies that are softer and thicker, I should change the over temperature to a _____ temperature with a _____ baking time.
   a) Lower; longer
   b) Lower; shorter
   f) Higher; longer
   ★ Higher; shorter

INSTRUCTOR MATERIALS

Cookie Group Application Exercise

CHOCOLATE CHIP COOKIE RECIPE

INGREDIENTS

2 cups all-purpose flour
1 teaspoon baking soda
1 teaspoon salt
1 cup (2 sticks) butter, softened
1 cup granulated sugar
3/4 cup packed brown sugar
1 teaspoon vanilla extract
2 large eggs
2 1/2 cups (12-oz. pkg.) Semi-Sweet Chocolate Chips

PREHEAT oven to 375° F.

COMBINE flour, baking soda and salt in small bowl. Beat butter, brown and white sugar, and vanilla. Beat in eggs. Gradually beat in flour mixture. Stir in chocolate chips. Divide and place on baking sheet.

BAKE for 10 minutes or until golden brown.

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1) Discuss ways to edit the ingredient list to create chewier, thicker cookies:

-Change the butter to margarine
-Use less flour
-Change the ratio of brown to white sugar (high proportion of brown sugar)

2) What other changes to the recipe (other than ingredients) could help contribute to softer, thicker cookies?

-Cook at a higher temperature for a shorter period of time

3) Discuss ways to edit the ingredients to create crisper, browner cookies:

-Add more flour
-Change the ratio of white to brown sugar (higher proportion of white sugar)