

Fair Grading and Effective Feedback

Olivia Harper Wilkins, G5, Chemistry

Caltech

Learning Outcomes

By the end of this session, you will be able to:

- Differentiate between effective and ineffective grading and feedback
- Communicate clear expectations to students
- Grade consistently and fairly
- Provide efficient and effective feedback for students



Learning Outcomes

By the end of this session, you will be able to:

- Differentiate between effective and ineffective grading and feedback
- Communicate clear expectations to students
- Grade consistently and fairly
- Provide efficient and effective feedback for students

Reflecting on your own experiences

Pause and reflect

What are some ways, as a student or instructor, that you've experienced **effective feedback**?

What about **ineffective feedback**?

Reflecting on your own experiences

Effective feedback

- Areas for improvement clear
- Diagnosing origin of error(s) / deconstructing problems
- Positive reinforcement
- Make students feel encouraged
- Timely

Ineffective feedback

- Just “No,” “See solutions,” or “What were you thinking?”
- Illegible writing
- Scores on rubrics with no rationale
- Too many comments = overwhelming
- Difficult to decipher tone



Learning Outcomes

By the end of this session, you will be able to:

- Differentiate between effective and ineffective grading and feedback
- **Communicate clear expectations to students**
- Grade consistently and fairly
- Provide efficient and effective feedback for students

Communicating clear expectations

Example

Assignment: Write a full report on experiment 1. Include an abstract, introduction, methods, results and discussion, and conclusion. You will be graded out of 100 points. Due Friday.

Communicating clear expectations

Example

Assignment: Write a **full report** on experiment 1. Include an abstract, introduction, methods, results and discussion, and conclusion. You will be graded out of 100 points. Due Friday.

- What does a report entail in terms of formality, writing style, and general structure?

Communicating clear expectations

Example

Assignment: Write a full report on experiment 1. Include an abstract, introduction, methods, results and discussion, and conclusion. You will be graded out of 100 points. Due Friday.

- What does a report entail in terms of formality, writing style, and general structure?
- What types of information go into each section?

Communicating clear expectations

Example

Assignment: Write a full report on experiment 1. Include an abstract, introduction, methods, results and discussion, and conclusion. You will be graded out of **100 points**. Due Friday.

- What does a report entail in terms of formality, writing style, and general structure?
- What types of information go into each section?
- How will points be allotted? How should students prioritize their time?

Communicating clear expectations

Pause and reflect

Assignment: Write a full report on experiment 1. Include an abstract, introduction, methods, results and discussion, and conclusion. You will be graded out of 100 points. Due Friday.

How might we improve this assignment description?

Communicating clear expectations

- **Transparent teaching** has been shown to significantly improve student learning and grades.

Communicating clear expectations

- **Transparent teaching** has been shown to significantly improve student learning and grades.
- In designing assignments, communicate the following:
 - **Purpose of the assignment**
 - What skills will/should students practice?
 - What knowledge will students gain?

Communicating clear expectations

- **Transparent teaching** has been shown to significantly improve student learning and grades.
- In designing assignments, communicate the following:
 - **Purpose of the assignment**
 - **Task(s) at hand**
 - What are students actually doing?
 - What steps should be followed?
 - Is there a specific format or workflow that should be employed?

Communicating clear expectations

- **Transparent teaching** has been shown to significantly improve student learning and grades.
- In designing assignments, communicate the following:
 - **Purpose of the assignment**
 - **Task(s) at hand**
 - **Criteria for success**
 - What does excellence look like?
 - Share examples of “good” work e.g. answer keys for similar problems, sample lab reports, sample presentations
 - List expectations so they can focus on higher order concerns like content and understanding



Learning Outcomes

By the end of this session, you will be able to:

- Differentiate between effective and ineffective grading and feedback
- Communicate clear expectations to students
- **Grade consistently and fairly**
- Provide efficient and effective feedback for students

Grading exercise

Pause and reflect

- **Question:** Find y for $x = 3$ when $4y = 3x - 1$ (4 points)
- **Answer:** $y = 2$

Student 1:

$$y=2$$

Student 2:

$y=2$ (code attached)

Student 3:

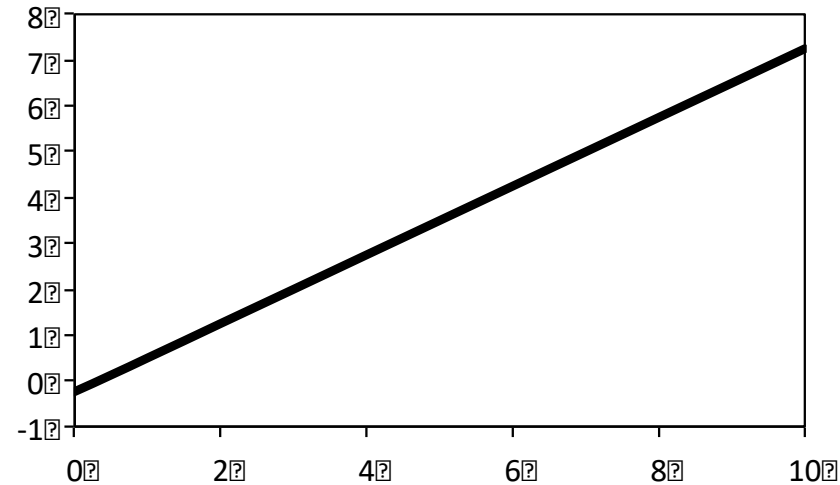
$$4y=3(3)-1;$$

$$4y=9-1$$

$$4y=8$$

$$y=32$$

Student 4:



Grading exercise

Pause and reflect

- **Question:** Find y for $x = 3$ when $4y = 3x - 1$ (4 points)
- **Answer:** $y = 2$

Student 1:

$$y=2$$

Student 3:

$$4y=3(3)-1;$$

$$4y=9-1$$

$$4y=8$$

$$y=32$$

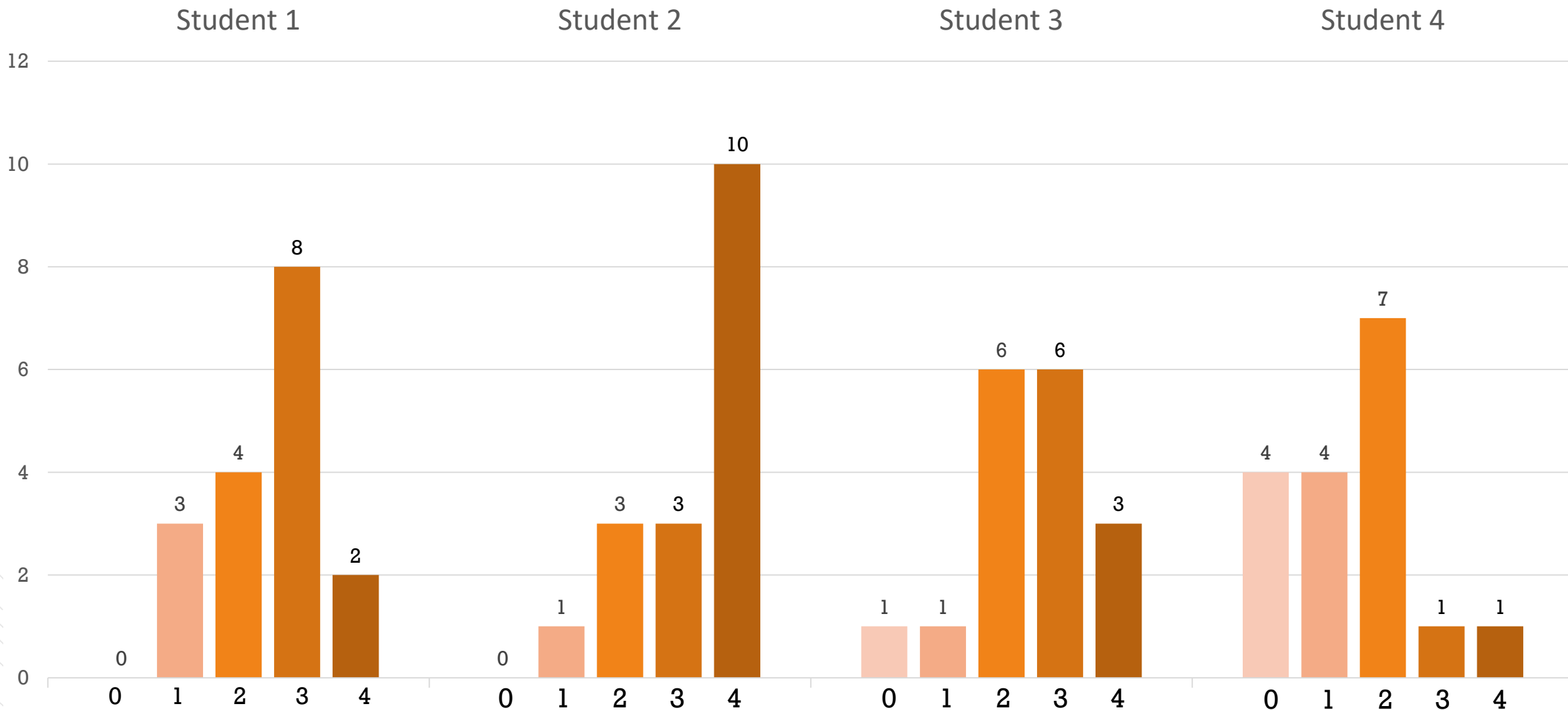
How would you grade these responses?

Go to <https://forms.gle/zwhc3MqvkfQhsCtcA>
or scan the QR code:



Grading exercise

Initial distribution of points assigned (n = 17)



Grading exercise

Pause and reflect

- **Question:** Find y for $x = 3$ when $4y = 3x - 1$ (4 points)
- **Answer:** $y = 2$

Student 1:

$$y=2$$

Student 2:

$$y=2 \text{ (code attached)}$$

Student 3:

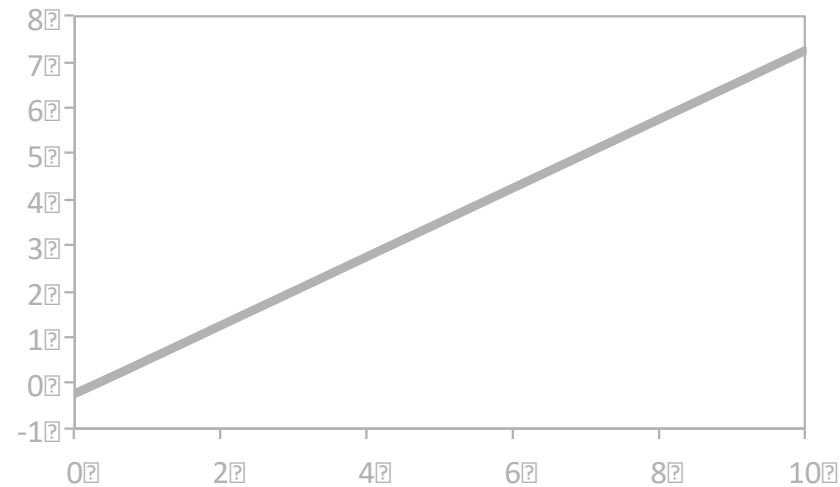
$$4y=3(3)-1;$$

$$4y=9-1$$

$$4y=8$$

$$y=32$$

Student 4:



How would your grading change if you had been given this rubric?

Criterion	Points
Answers question	1
Correct answer	1
Shows work	1
Quality and clarity of work	1

Rubrics – a tool for consistent grading

For the student

- **If given before due date:** help students focus on important content
- **If returned with graded assignment:** break down areas of improvement in organized manner
- **Benefits (according to education research):**
 - Increased grades
 - Increased class participation
 - Enhanced understanding of material



Rubrics – a tool for consistent grading

For the student

- **If given before due date:** help students focus on important content
- **If returned with graded assignment:** break down areas of improvement in organized manner
- **Benefits (according to education research):**
 - Increased grades
 - Increased class participation
 - Enhanced understanding of material

For the instructor/TA

- Consistent and reliable grading over time and with multiple graders
- Faster, less-stressful grading



Rubrics – design

```
graph LR; A[Select criteria] --> B[Develop scale]; B --> C[Assign points]
```

Select
criteria

Develop
scale

Assign
points

Rubrics – design

Select
criteria

Develop
scale

Assign
points

- Consider the **purpose** of the assignment
- Think of content and style **categories**

Criterion				
Eye contact				

Rubrics – design

Select
criteria

Develop
scale

Assign
points

- Split criteria into levels
 - **Binary:** yes/no, present/absent; objective
 - **Multi-level:** more detailed; subjective

Criterion				
Eye contact				

Rubrics – design

Select
criteria

Develop
scale

Assign
points

- Split criteria into levels
 - **Binary:** yes/no, present/absent; objective
 - **Multi-level:** more detailed; subjective

Criterion				
Eye contact	No eye contact, read directly from slides	Minimal eye contact, mostly read slides	Eye contact with 1-2 people, some slide reading	Eye contact with multiple people throughout

Rubrics – design

Select
criteria

Develop
scale

Assign
points

- Assign points for each level
- Do not need to distribute evenly
- More important criteria = more points

Criterion				
Eye contact	No eye contact, read directly from slides	Minimal eye contact, mostly read slides	Eye contact with 1-2 people, some slide reading	Eye contact with multiple people throughout

Rubrics – design

Select
criteria

Develop
scale

Assign
points

- Assign points for each level
- Do not need to distribute evenly
- More important criteria = more points

Criterion	<i>0 points</i>	<i>1 point</i>	<i>2 points</i>	<i>3 points</i>
Eye contact	No eye contact, read directly from slides	Minimal eye contact, mostly read slides	Eye contact with 1-2 people, some slide reading	Eye contact with multiple people throughout

Rubrics – design

Select
criteria

Develop
scale

Assign
points

Pause and reflect

Develop part of a rubric for an assignment you might use in a class.

Criterion	<i>0 points</i>	<i>1 point</i>	<i>2 points</i>	<i>3 points</i>
Eye contact				

Rubrics – tips for grading

- Revise your rubric after grading the first few assignments, if necessary.
- Aim to spend equal time on each piece of work.
- Grade a single problem across all assignments instead of grading each assignment in series.
- Use the rubric as a marking tool and return it to students with the graded assignment.
- Take breaks so you make fewer mistakes!



Learning Outcomes

By the end of this session, you will be able to:

- Differentiate between effective and ineffective grading and feedback
- Communicate clear expectations to students
- Grade consistently and fairly
- **Provide efficient and effective feedback for students**

Effective feedback – what is it?

- Understandable and accessible
 - Quantity: enough to be useful, not too much that it's overwhelming
 - Quality: legible, coherent, marking key (especially for writing)

Effective feedback – what is it?

- Understandable and accessible
 - Quantity: enough to be useful, not too much that it's overwhelming
 - Quality: legible, coherent, marking key (especially for writing)
- **Constructive**
 - Balance positive and negative
 - Focus on the action, not the person

Effective feedback – what is it?

- Understandable and accessible
 - Quantity: enough to be useful, not too much that it's overwhelming
 - Quality: legible, coherent, marking key (especially for writing)
- Constructive
 - Balance positive and negative
 - Focus on the action, not the person
- **Can be usefully incorporated**
 - Timeliness
 - Directs future effort

Effective feedback – methods

■ Rubrics

Criterion	0 pt	1 pt	2 pt	3 pt
Eye Contact	No eye contact, reading directly from slides	Minimal eye contact, mostly reading slides	Eye contact with 1-2 people, some reading slides	Eye contact with multiple people throughout



Effective feedback – methods

■ Rubrics

Criterion	0 pt	1 pt	2 pt	3 pt
Eye Contact	No eye contact, reading directly from slides	Minimal eye contact, mostly reading slides	Eye contact with 1-2 people, some reading slides	Eye contact with multiple people throughout
	■	■	■	■
	■	■	■	■
	■	■	■	■

■ Model answers

Answer the following algebra problems.
Show your work, as in the example below:

Example Question:

Find y for $x=5$ when $3y=3x-6$

Example Answer: $3y = 3(5) - 6$

$$3y = 15 - 6$$

$$3y = 9$$

$$y = 3$$

Effective feedback – methods

■ Rubrics

Criterion	0 pt	1 pt	2 pt	3 pt
Eye Contact	No eye contact, reading directly from slides	Minimal eye contact, mostly reading slides	Eye contact with 1-2 people, some reading slides	Eye contact with multiple people throughout
	■	■	■	■
	■	■	■	■
	■	■	■	■

■ Model answers

Answer the following algebra problems.
Show your work, as in the example below:

Example Question:

Find y for $x=5$ when $3y=3x-6$

Example Answer: $3y = 3(5) - 6$

$$3y = 15 - 6$$

$$3y = 9$$

$$y = 3$$

■ Shorthand guide

TA's Shorthand Guide

SW = Show Work

Alg = Algebra error

CN = Citation Needed

SP = Spelling Error

Effective feedback – methods

■ Rubrics

Criterion	0 pt	1 pt	2 pt	3 pt
Eye Contact	No eye contact, reading directly from slides	Minimal eye contact, mostly reading slides	Eye contact with 1-2 people, some reading slides	Eye contact with multiple people throughout
	■	■	■	■
	■	■	■	■
	■	■	■	■

■ Model answers

Answer the following algebra problems. Show your work, as in the example below:

Example Question:

Find y for $x=5$ when $3y=3x-6$

Example Answer: $3y = 3(5) - 6$

$$3y = 15 - 6$$

$$3y = 9$$

$$y = 3$$

■ Shorthand guide

TA's Shorthand Guide

SW = Show Work

Alg = Algebra error

CN = Citation Needed

SP = Spelling Error

■ Directed feedback

Ishmael Aziz
Lab Report #2

Ishmael –
Overall, this was a good improvement from report #1!
The main things for you to work on are formatting figures and working on voice/tense in writing. It looks like you have a good understanding of the science.
Please see me in my office hours if you have questions!

In this lab experiment, I had an unknown acid and I

Effective feedback – methods

Rubrics

Criterion	0 pt	1 pt	2 pt	3 pt
Eye Contact	No eye contact, reading directly from slides	Minimal eye contact, mostly reading slides	Eye contact with 1-2 people, some reading slides	Eye contact with multiple people throughout
	■	■	■	■
	■	■	■	■
	■	■	■	■

Model answers

Answer the following algebra problems.
Show your work, as in the example below:

Example Question:

Find y for $x=5$ when $3y=3x-6$

Example Answer: $3y = 3(5) - 6$

$$3y = 15 - 6$$

$$3y = 9$$

$$y = 3$$

Shorthand guide

TA's Shorthand Guide

SW = Show Work

Alg = Algebra error

CN = Citation Needed

SP = Spelling Error

Directed feedback

Ishmael Aziz
Lab Report #2

Ishmael –
Overall, this was a good improvement from report #1!
The main things for you to work on are formatting figures and working on voice/tense in writing. It looks like you have a good understanding of the science.
Please see me in my office hours if you have questions!

In this lab experiment, I had an unknown acid and I

General commentary

Hi everyone!

I noticed some common mistakes in the last report, so here are some general comments to consider on your upcoming report.

When writing a lab report, you should use a third person voice:

- 1st: We dissolved 5.00g KMnO_4 in 20.00 mL water and stirred for 2 hours. (Incorrect)
- 2nd: Dissolve 5.00g KMnO_4 in 20.00 mL water and stir for 2 hours. (Incorrect)
- 3rd: **5.00g KMnO_4 was dissolved in 20.00 mL water and stirred for 2 hours. (Correct!)**

Effective feedback - reflection

Pause and reflect

Think back to the grading exercise we did earlier...

- Would you only provide a raw score?
- Would you correct students' mistakes or indicate where they went wrong?
- How would you indicate what was wrong? A circle around the mistake? Strikethrough?
- Would you leave any written comments explaining the issue in more detail?
- If your answers to these questions depends on the situation, what factors would go into how you approach grading?

■ **Question:** Find y for $x = 3$ when $4y = 3x - 1$ (4 points)

■ **Answer:** $y = 2$

Common questions and challenges

- “How will this be graded?”
- “My answer is correct; why didn’t I get full points?” *(no work shown)*
- “I think I should have gotten points for this!” *(partially correct answer)*
- “My friend didn’t lose points for this!” “I didn’t lose points last time!”
- “Am I allowed to use the Internet (or other resources) on this assignment?”
- “I didn’t understand what I was supposed to do.”
- “Can I still get an A in the class? How badly will this hurt my final grade?”



Best practices

- Communicate clear expectations.
- Be consistent in grading (e.g. use rubrics).
- Give constructive and informative feedback.

Next Steps

- Please visit <https://teach.caltech.edu> for more resources on teaching remotely
- Visit <https://learn.caltech.edu> for more resources on learning remotely