Welcome to the Classroom Observation Protocol for Undergraduate STEM (COPUS)!

This observation instrument is described in M. K. Smith, F. H. M. Jones, S. L. Gilbert, and C. E. Wieman (2013). The Classroom Observation Protocol for Undergraduate STEM (COPUS): a New Instrument to Characterize University STEM Classroom Practices. CBE-Life Sciences Education, Vol 12(4), pp. 618-627; www.cwsei.ubc.ca/resources/COPUS.htm.

The COPUS records all the activities that happen in a class: what the students do and what the instructor does, and when. The picture that emerges can serve as the basis for a discussion of what the instructor did in the class session, what they intended to do, and the methods they used. This spreadsheet uses the data you collect and visualizes it in a variety of ways; you may choose one to use in your discussions with the faculty member being reviewed, or use them all.

Although the COPUS was designed for use in Science, Technology, Engineering, and Math (STEM) classrooms, a representative from the Teaching Effectiveness Program at the University of Oregon has tested the protocol in a variety of non-STEM classes and found it to be a useful tool in all of them.

To use this protocol, simply open the "COPUS data entry" worksheet in this workbook (see the tabs at the bottom of the screen) and mark the codes indicating what the instructor is doing and what the students are doing for every two-minute period in the class session (enter a "1" in the approriate cell). Add comments to elaborate and describe what is happening. Mark multiple codes if appropriate; choose "Other" if no specific codes apply. Before you attempt to use the COPUS in a real class, it is important to familiarize yourself with the meanings of the codes and how they are used, and also to practice coding. The COPUS paper referred to above defines the codes used, and a training guide with links to videos that can be used for practice can be found at http://www.cwsei.ubc.ca/resources/files/COPUS_Training_Protocol.pdf. The suggested videos are all recordings of science classes. You may want to look online to find other classes closer to your discipline. Note that it is generally considerably easier to use the COPUS while sitting in a classroom than while watching a video. It would be a good idea to practice with a partner so you can discuss difficult coding choices. If you have questions about using the COPUS or the various visualizations generated in this spreadsheet, please contact Julie Mueller (jmueller@uoregon.edu) of the Teaching Engagement Program.

The COPUS instrument is designed for use in observing "lecture" classes, not laboratory or studio classes. An analogous instrument designed for use in laboratory classes is described in J. B. Velasco, A. Knedeisen, D. Xue, T. L. Vickrey, M. Abebe, and M. Stains (2016). J. Chem. Educ. Article ASAP (http://pubs.acs.org.libproxy.uoregon.edu/doi/ipdf/10.1021/acs.jchemed.6b00062)

Description of worksheets in this file:

(Access them by clicking the tabs at the bottom of this sheet.)

Introduction: References, information for using the COPUS

Key to observation codes: A list and descriptions of all the possible activity codes for the instructor and students.

COPUS data entry: The worksheet where you record the activities occurring in each two-minute interval in the class session. Enter a "1" in the cell to indicate the activity is occurring.

Qualitative questions: Some questions you may find helpful in considering the effectiveness of the class session. These questions are not part of the official COPUS protocol; they were added at the University of Oregon and are optional.

Activities across time: This worksheet contains visualizations of which activities occurred when in the class. These visualizations are useful in depicting the flow of the class session.

Percent of activities graphs: The bars in these graphs are calculated by finding the total number of times a given activity occurred during the class period and dividing by the total number of times *all* activities (student or instructor, as appropriate) occurred during the class period.

Percent of time intervals graphs: The bars in these graphs are calculated by finding the total number of times a give activity occurred during the class period and dividing by the total number of 2-minute time intervals in the class period.

Observation codes

1. Students are doing

L	Listening to instructor/taking notes, etc.
AnQ	Student answering a question posed by the instructor with rest of class listening
SQ	Student asking a question
WC	Engaged in whole-class discussion by offering explanations, opinion, judgment, etc. to whole class, often facilitated by instructor
SP	Presentation by student(s)
Ind	Individual thinking/problem solving. Only mark when an instructor explicitly asks students to think about a clicker question or another question/problem on their own.
CG	Discuss clicker question in groups of 2 or more students
WG	Working in groups on worksheet activity
OG	Other assigned group activity, such as responding to instructor question
Prd	Making a prediction about the outcome of demo or experiment
TQ	Test or quiz
W	Waiting (instructor late, working on fixing AV problems, instructor otherwise occupied, etc.)
O	Other- explain in comments.

2. Instructor is doing

Lec	Lecturing (presenting content, deriving mathematical results, presenting a problem solution, etc.)
RtW	Real-time writing on board, doc. projector, etc. (often marked along with Lec)
D/V	Showing or conducting a demo, experiment, simulation, video, or animation
Fup	Follow-up/feedback on clicker question or activity to entire class
PQ	Posing non-clicker question to students
CQ	Asking a clicker question (mark the entire time the instructor is using a clicker question, not just when first asked)
AnQ	Listening to and answering student questions with entire class listening
MG	Moving through class guiding ongoing student work during active learning task
1o1	One-on-one extended discussion with one or a few individuals, not paying attention to the rest of the class (can be marked along with MG or AnQ)
Adm	Administration (assignm homework, return tests, etc.)
W	Waiting when there is an opportunity for an instructor to be interacting with or observing/listening to student of group activities and the instructor is not doing so
O	Other- explain in comments

3. Student Engagement (optional)

L	Small fraction (10-20%) obviously engaged
M	Substantial fractions both clearly engaged and clearly not engaged
H	Large fraction of students (80+%) clearly engaged in class activity or listening to instructor.

Student engagement alternatives:

(1) Just mark when engagement is obviously high or obviously low.

(2) Count "N" students near you (~10) and assess how many appear engaged at every 2-minute interval. Enter the value for all engaged instead of marking L/M/H/. NOTE what your value of N was.

Suggestions regarding codes and comments:

Clarify code choices with comments.
Consider indicating your confidence regarding coding, especially when you aren't sure about your choice of codes

Note: Enter a "1" in the appropriate cell to indicate an activity that happens in a 2 minute time period.
Check multiple codes per 2 minutes if multiple activities occur in that 2 minute time period

Date:	**Class:**	**Instructor:**	**No. students:**	**Observer Name:**
Classroom arrangement:				

Students are doing:
1. **L**-Listening; **Ind**-Individual work; **CG**-Clicker Q discussn; **WG**-Worksheet group work; **OG**-Other group work; **AnQ**-Answer Q; **SQ**-Student Q; **WC**-Whole class discuss.; **Prd**-Predicting; **SP**-Student present.; **TQ**-Test/quiz; **W**-Waiting; **O**-Other

Instructor is doing:
2. **Lec**-Lecturing; **RtW**-Writing; **FUp**-Follow-up; **PQ**-Pose Q; **CQ**-Clicker Q; **AnQ**-Answer Q; **MG**-Moving/Guiding; **1o1**-One-on-one; **D/V**-Demo+; **Adm**-Admin; W-Waiting; **O**-Other

For each 2 minute interval, type a "1" in a cell to indicate the activity is occurring. Check multiple columns where appropriate.

COPUS

	1. Students doing													2. Instructor doing												3. Engagement			**Comments:** EG: explain difficult coding choices, flag key points for feedback for the instructor, identify good analogies, etc.
min	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
0 - 2												1													1				
2	1																						1						
4	1		1											1						1									
6	1													1															
8 - 10							1												1		1								
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
10 - 12							1												1		1								
12							1												1		1								
14	1																1												
16	1																1												
18 - 20	1													1															
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
20 - 22	1	1												1				1											
22	1																1												
24	1																1												
26	1													1															
	1													1															
	1. Students doing													**2. instructor doing**												**3. Engagement**			**Comments:** EG: explain difficult coding choices, flag key points for feedback for the instructor, identify good analogies, etc.
min	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
30 - 32														1															
32										1								1											
34	1															1													
36	1															1													
38 - 40	1								1									1			1								
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
40 - 42									1								1	1			1								
42	1																1												
44	1																1												
46						1												1											
48 - 50						1												1											
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
50-52																													
52																													
54																													
56																													
58-60																													
	1. Students doing													**2. instructor doing**												**3. Engagement**			**Comments:** EG: explain difficult coding choices, flag key points for feedback for the instructor, identify good analogies, etc.
min	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
60-62																													
62																													
64																													
66																													
68-70																													
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
70-72																													
72																													
74																													
76																													
78-80																													
	1. Students doing													**2. instructor doing**												**3. Engagement**			**Comments:** EG: explain difficult coding choices, flag key points for feedback for the instructor, identify good analogies, etc.
min	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
80-82																													
82																													
84																													
86																													
88-90																													
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
90-92																													
92																													
94																													
96																													
98-100																													
	L	AnQ	SQ	WC	SP	Ind	CG	WG	OG	Prd	TQ	W	O	Lec	RtW	D/V	Fup	PQ	CQ	AnQ	MG	1o1	Adm	W	O	L	M	H	
100-102																													
102																													
104																													
106																													
108-110																													
Sum	16	1	1	0	0	2	3	0	2	1	0	1	0	7	0	2	7	6	3	1	5	0	1	0	1				
Total	27													33															

Student activity codes

L-Listening; **Ind**-Individual work; **CG**-Clicker Q discussn; **WG**-Worksheet group work; **OG**-Other group work; **AnQ**-Answer Q; **SQ**-Student Q; **WC**-Whole class discuss.; **Prd**-Predicting; **SP**-Student present.; **TQ**-Test/quiz; **W**-Waiting; **O**-Other

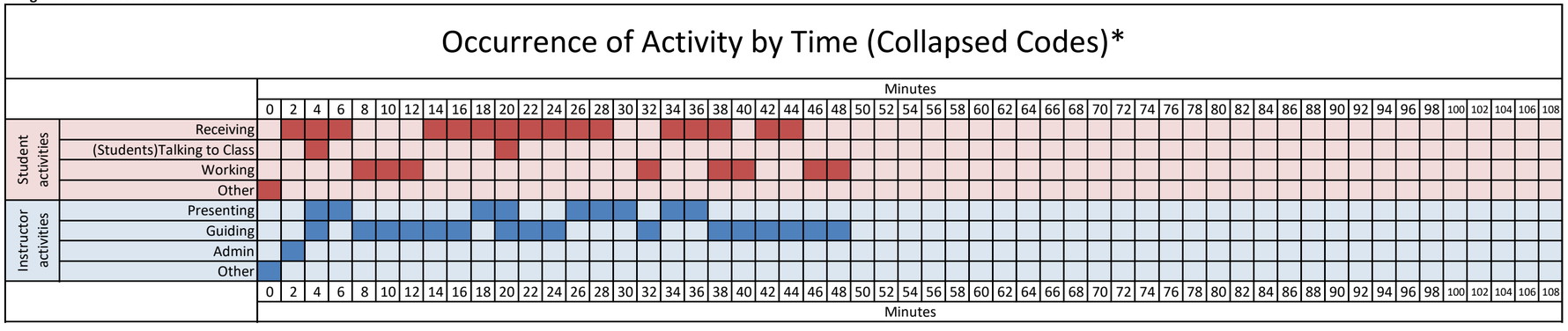
Instructor activity codes

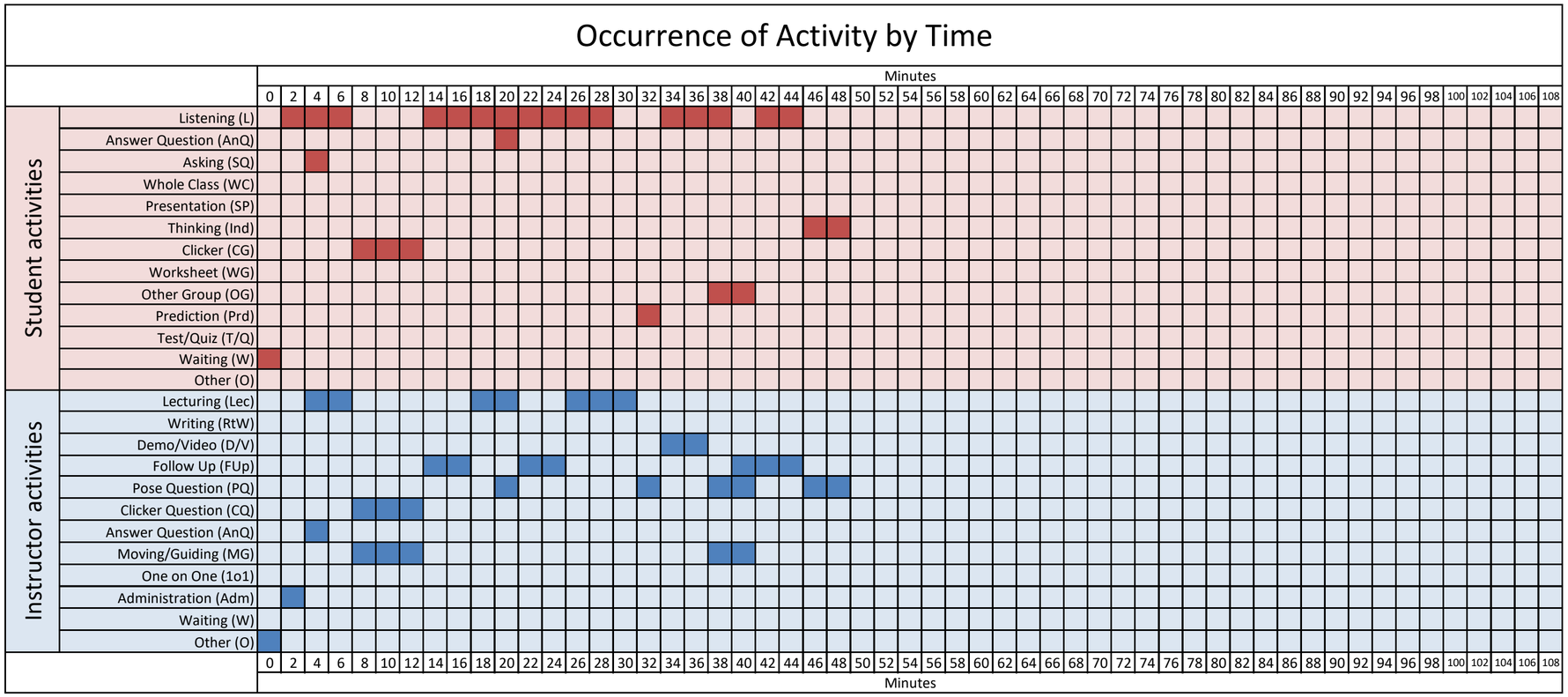
Lec-Lecturing; **RtW**-Writing; **FUp**-Follow-up; **PQ**-Pose Q; **CQ**-Clicker Q; **AnQ**-Answer Q; **MG**-Moving/Guiding; **1o1**-One-on-one; **D/V**-Demo+; **Adm**-Admin; W-Waiting; **O**-Other

This page contains qualitative questions you may want to consider.

	Observer Comments:
Teaching Strategies: 1. Did the instructor use a variety of teaching techniques in conducting the class (small groups, paired learning, whole group discussion, silent writing and reflection, feedback discussion)? 2. What techniques were used to freshen the energy and attention of the students periodically during the class – especially if the class lasts two hours? 3. When posing questions to the class, did the instructor allow students 5 - 15 seconds to reflect before rephrasing? Did the instructor avoid answering their own questions? 4. Did the class session include low-stakes assessment (such as iClicker questions, one-minute papers, muddiest point papers) to help the instructor and students gauge progress.?	**Teaching Strategy Comments:**
Organization: 1. Did the students have a preview of the content to be covered at the beginning of class? 2. Was there any review of the preceding session, effort to place this day's session into the big picture of the course, and/or connections made to real-world phenomena or other disciplines? 3. Were there internal summaries of the material being covered? 4. Were visuals or demos used for clarity/emphasis? 5. Were the important points summarized at the close of class? Was there a reflective activity at the end of class?	**Organization Comments**:
Content: 1. Did the instructor teach the class at a level appropriate for the students? 2. Were there good illustrative examples for all major concepts? 3. Was there an effective way to tie facts to course themes? 4. What major questions/themes were addressed?	**Content Comments:**
Rapport: 1. Were questions and discussion from students encouraged? 2. For the questions presented to students - to what level of critical thinking were they challenged? 3. Were student questions repeated/paraphrased/clarified? 4. Did the instructor use student names or make attempts to learn them?	**Rapport Comments:**
Inclusive Classroom: 1. Did the instructor choose content to reflect a diversity of voices, where appropriate? 2. How did the instructor encourage and facilitate dialogue, discussion, and student-student interaction for all students (e.g. help people find partners, structure activities to promote equal participation.) 3. Did the instructor design the class session to be accessible and welcoming to all (e.g. pictures show a variety of races, ethnicities, and genders; names used in problems are not ethnocentric). 4. Did the instructor use respectful and inclusive language and work to ensure a respectful and open learning community?	**Inclusive Classroom Comments:**

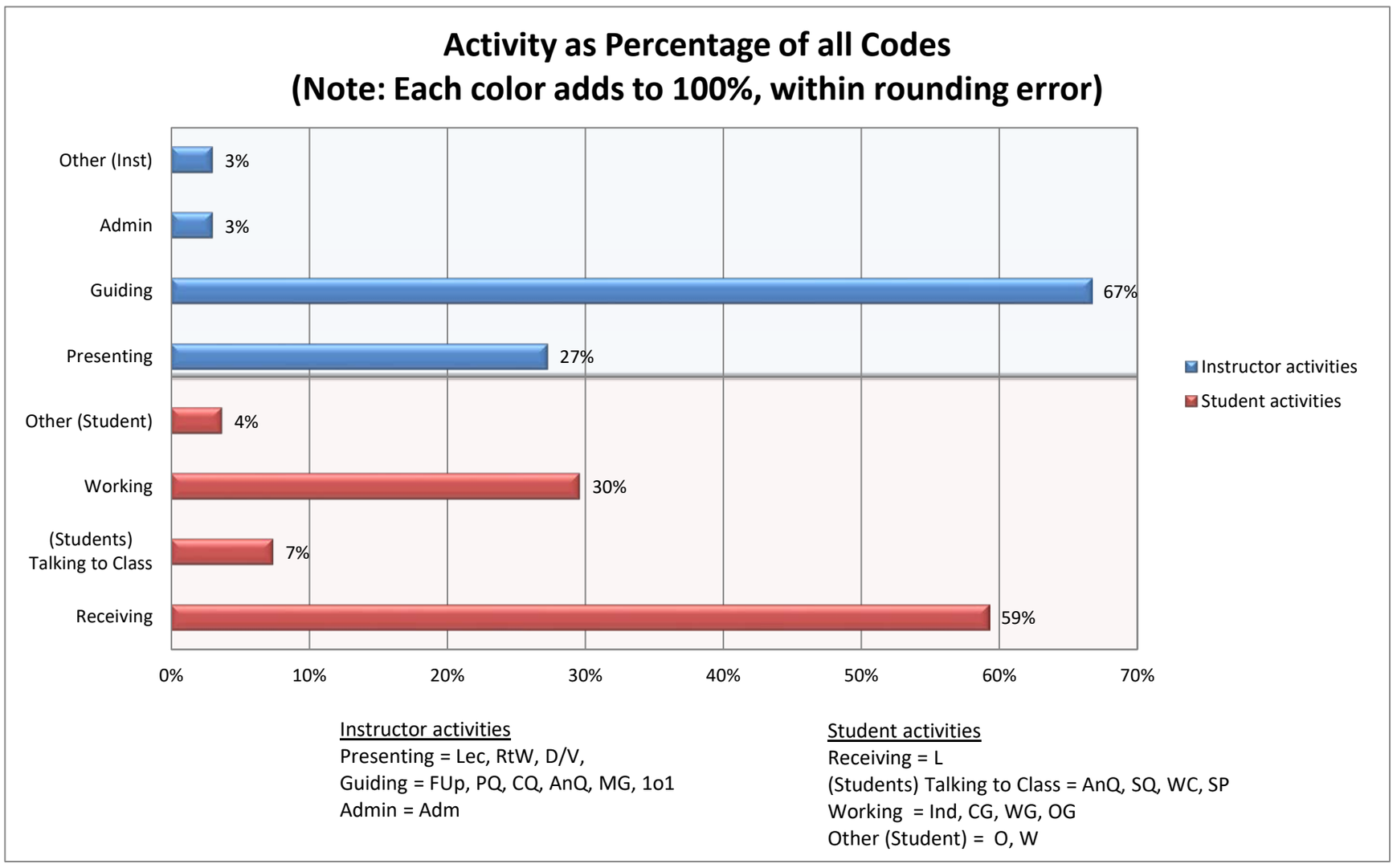
This worksheet shows which activities occurred in each 2-minute time interval. Rows show the time periods in which a given activity occurred. Columns show which activities were marked in each time interval. This visualization can give insights into the overall flow of the class.





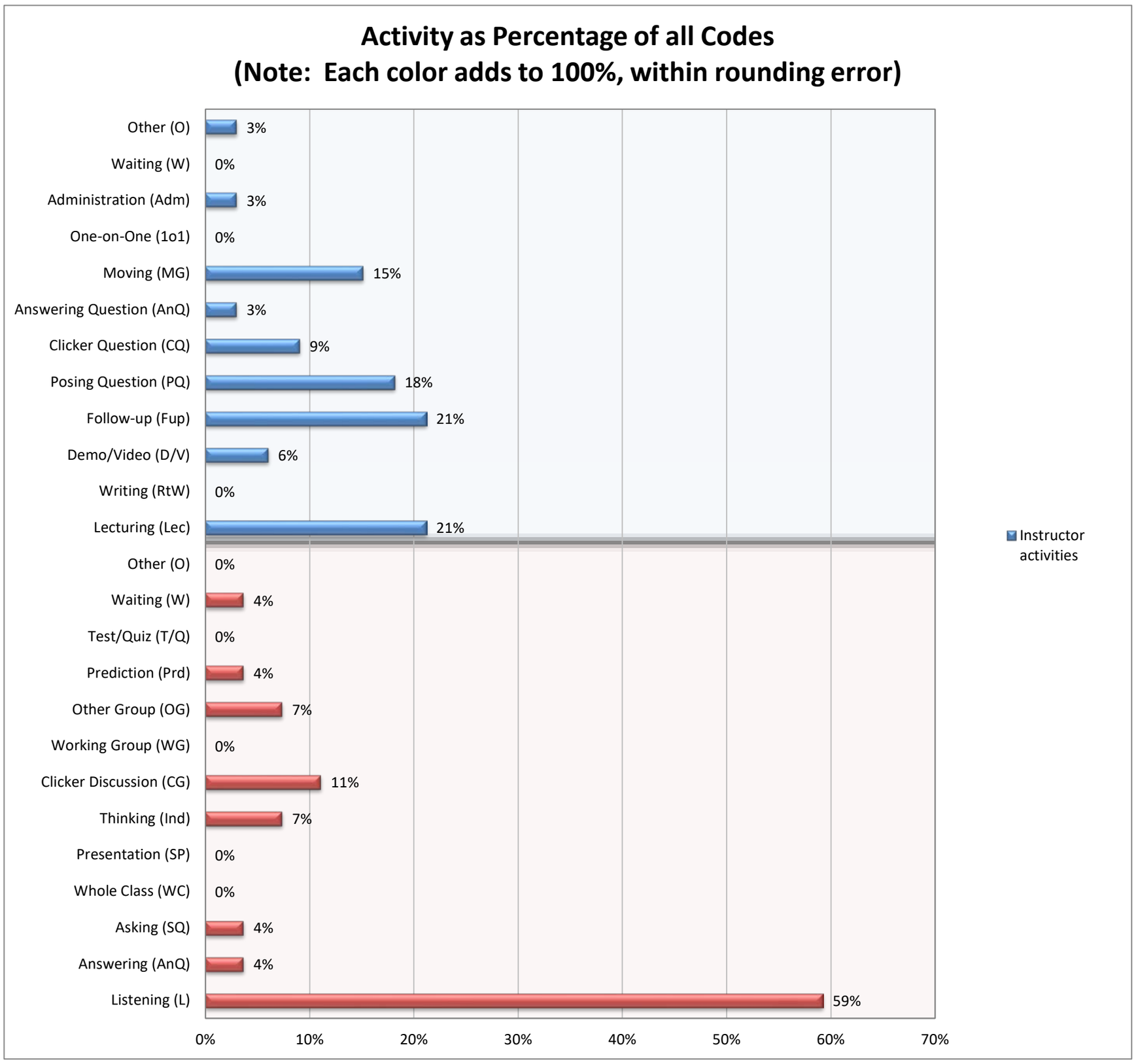
*As defined in Smith MK, Vinson EL, Smith JA, Lewin JD, Stetzer MR. 2014. A Campus-Wide Study of STEM Courses: New Perspectives on Teaching Practices and Perceptions, CBE-Life Sciences Education 13(4), pp. 624–635.
Receiving = Listening to instructor (L)
Talking to Class = Student answering question (AnQ), Student asking question (SQ), Whole-class discussion (WC), Students presenting to entire class (SP)
Working = Individual thinking (Ind), Discussing clicker question (CG), Working in groups on worksheet (WG), Other group activity (OG), Making prediction (Prd), Test/Quiz (TQ)
Other = Waiting (W), Other (O)
Presenting = Lecturing or presenting information (Lec), Real-time writing (RtW), Demonstration/Video (D/V)
Guiding = Follow-up/feedback on activity (FUp), Pose question (PQ), Pose clicker question (CQ), Listening to and answering student questions (AnQ), Moving and Guiding (MG), One on one discussion (1o1)
Administration = Administration (Adm)
Other = Waiting (W) or Other (O)

The graphs on this sheet show how frequently a given activity code was marked compared to the sum of all codes marked in all time intervals during the class session, expressed as a percent. Because a given activity may not occupy the full two minutes of a time interval, and because multiple activities may occur simultaneously (e.g. an instructor might be moving and guiding (MG) and having a one-on-one (1o1) interaction at the same time, these percents to not represent the fraction of time devoted to each activity. Rather they are the fraction of activities, calculated separately for the instructor's activities and the students' activities.



Instructor activities
Presenting = Lec, RtW, D/V,
Guiding = FUp, PQ, CQ, AnQ, MG, 1o1
Admin = Adm

Student activities
Receiving = L
(Students) Talking to Class = AnQ, SQ, WC, SP
Working = Ind, CG, WG, OG
Other (Student) = O, W



The graphs on this sheet show the fraction of time intervals in which each code was marked, expressed as a percent. Note that because a given activity may not occupy the full time interval (e.g. it may take only a few seconds for an instructor to pose a question but the time interval covers two full minutes), the graphs do not show the true fraction of class time spent on each activity. Rather, they simply show the fraction of time intervals in which a code was marked.