Code	Students are Doing
L	**Quick Definition:** Listening to instructor/taking notes, etc. **Descriptions:** • Often coded with **Lec**, **D/V**, **FuP**, **Adm**. **FAQ:** **Q:** Do I code **L** if the instructor is telling anecdotal stories that only somewhat or barely relate to what is happening in class? **A:** Yes, **L** includes listening to anecdotal stories only somewhat related to class.

Ind	**Quick Definition:**
	Individual thinking/problem solving
	
	Descriptions:
	• Use when the students think about something on their own; either instructor asks explicitly or this is clearly a classroom norm for the activity.
	• Don't code as **Ind**
	  o If the instructor asks the group to raise hands to answer a question.
	  o If most students are talking in groups, *even if the instructor did not tell them to work in groups*. If most students are talking, code **CG**.
	• **Ind** and **CG/WG/OG** are typically not coded simultaneously. **Ind** and **WG/OG/CG** could be coded simultaneously if an instructor explicitly tells students they may work in groups or individually, and you actively see students doing both.
	
	FAQ:
	Q: What if an instructor asks them to answer clicker questions, worksheet questions or other group activity questions on their own? Do I code **Ind** and/or **CG/WG/OG**?
	A: If an instructor explicitly asks (or expects) students to think about a question/problem on their own on a worksheet, course notebook, online module predictions, etc., code **Ind** only. For clicker questions, pick the code that fits best based on what you see happening in the class (**Ind** or **CG**). See **CG** description below for more details.
	
	Q: What if they are asked to make a prediction on their own using a clicker?
	A: If a clicker question is used to make a prediction *on their own*, mark it both as **Ind** and **Prd**. You only mark **CG** when they are discussing clicker questions in groups of 2 or more.
	
	Q: When a question is presented but the instructor doesn't allow the students to immediately start working on it, do you code **Ind** when the question is asked or when they are allowed to work on it?
	A: Only code **Ind** once the students are allowed to work on it.

CG	**Quick Definition:** Discuss clicker question in groups of *2 or more students* **Descriptions:** • Code as **OG** if they are using a different voting system other than a clicker. • If a clicker question is used to make a prediction in groups of *2 or more students*, mark it both as **CG** and **Prd**. **FAQ:** **Q:** When an instructor asks a question and doesn't allow the students to immediately start working on it, do you code **CG** when the question is asked or when they are allowed to work on it? **A:** Only code **CG** once the students are allowed to work on it. **Q:** What if they are asked to make a prediction on their own using a clicker? **A:** If a clicker question is used to make a prediction *on their own*, mark it both as **Ind** and **Prd**. You only mark **CG** when they are discussing clicker questions in groups of 2 or more.
WG	**Quick Definition:** Working in groups on worksheet activity **Descriptions:** • Only use this code for actual worksheet activities that were handed out during class. This includes worksheets that were handed out in previous classes but were not yet finished. • Any other group work would be coded as **OG**. **FAQ:** **Q:** When an instructor asks a question and doesn't allow the students to immediately start working on it, do you code **WG** when the question is asked or when they are allowed to work on it? **A:** Only code **WG** once the students are allowed to work on it. **Q:** Do you still code **WG** if the class does not turn in the worksheet at the end of class? **A:** Yes, you still code **WG** even if the worksheet isn't graded. **Q:** What are the distinguishing factors between **WG** and **OG**? **A: WG** should only be coded if a sheet with questions is handed out for the student to work on, otherwise the code should be **OG**. For example, an instructor having students working problems from a book and writing down the answers on their own paper would count as **OG** since a worksheet wasn't handed out.

OG	**Quick Definition:** Other assigned group activity, such as responding to instructor question **Descriptions:** • This could include various activities such as writing in course notebooks, answering questions on Blackboard or some other online module, and group singing. Try to list the activity in the notes section. • If the activity involves making a prediction, code **Prd** at the same time. **FAQ:** **Q:** What do you code for course notebooks? **A:** Course notebooks are coded as **OG** for the students and **PQ** for the professor. **Q:** When an instructor asks a question and doesn't allow the students to immediately start working on it, do you code **OG** when the question is asked or when they are allowed to work on it? **A:** Only code **OG** once the students are allowed to work on it. **Q:** What are the distinguishing factors between **WG** and **OG**? **A: WG** should only be coded if a sheet with questions is handed out for the student to work on, otherwise the code should be **OG**. For example, an instructor having students working problems from a book and writing down the answers on their own paper would count as **OG** since a worksheet wasn't handed out.
AnQ	**Quick Definition:** Student answering a question posed by the instructor with the rest of class listening **Descriptions:** • Only code for verbal answers, not hand raising without a verbal response. Hand raising without a verbal response should be coded as . • Students completing a fill-in-the -blank type statement aloud "This is termed…", also counts as **AnQ**. • Several students answering the question aloud at the same time can also be coded as **AnQ**.
SQ	**Quick Definition:** Student asks question **Descriptions:** • This is used when students ask questions *in front of the large group.* • A student could be asking a question to the instructor or to another student. • This could be coded in conjunction with **SP** if the students who are presenting ask a question to the class.

WC	**Quick Definition:** Engaged in whole class discussion by offering explanations, opinion, judgment, etc. to the whole class, often facilitated by the instructor **Descriptions:** • This tends to be coded when there is a discussion involving multiple student perspectives. • The instructor may have an active (e.g., providing new questions/responses) or passive (e.g., selecting speakers) role in the discussion.
Prd	**Quick Definition:** Making a prediction about the outcome of a *demo* or *experiment* **Descriptions:** • This could include time thinking on their own or to raise their hand based on what they think will occur (in this special case also code **Ind**). • This is often coded in conjunction with **Ind**, **CG**, **OG**, or **WG**. • This could be done individually or in a group. • Predictions are usually done before a demo or experiment has begun. **FAQ:** **Q:** When an instructor asks students to make a prediction but doesn't allow the students to immediately start working on it, do you code **Prd** when the instructor asks or when they are allowed to work on it? **A:** Only code **Prd** once the students are allowed to work on it. **Q:** If the instructor asks the students to make a new prediction or refine the one they already made while an experiment or demonstration is happening, do I code **Prd** and **D/V** at the same time? **A:** Yes, if the instructor has already begun the experiment and asks the students to make new predictions than they should be coded simultaneously.
SP	**Quick Definition:** Presentation by student(s) **Descriptions:** • This could include a pre-assigned student presentation or an occasion where the instructor asks a student to "take over" the class to teach a concept or to present a solution to a problem (or other activity) to the entire class. • Make sure to note what the other students are doing at the time, such as **L**, and if the instructor is doing anything that should be coded, such as **PQ**.

TQ	**Quick Definition:** Test or quiz **Descriptions:** • This could include both individual and group quizzes. • Group quizzes could also be coded as **TQ** and **OG** at the same time (e.g., 2-stage exam group questions).

W	**Quick Definition:**
	Waiting (instructor late, working on fixing AV problems, instructor otherwise occupied, etc.)
	
	Descriptions:
	• Don't mark quick transitions.
	• Only coded if…
	  o The instructor starts class late.
	  o The students have to wait a long time while the instructor passes out papers.
	  o The instructor tells everyone to take a break in the middle of class.

O	**Quick Definition:** Other – explain in comments **Descriptions:** • Use this code sparingly. • If used multiple times, review other codes to see if they should be recorded in another category (or ignored). • Discuss with observation partner after class if possible.

Code	Instructor is Doing
Lec	**Quick Definition:** Lecturing (presenting content, deriving mathematical results, presenting a problem solution, etc.) **Descriptions:** • Includes discussion on learning objectives, exam content, or other course content information. • Transitions from **FUp** to **Lec** may be hard to notice. • **FUp** and **Lec** should never be coded simultaneously but may appear in the same two minute time interval. **FAQ** **Q:** Does new information always need to be coded as **Lec**? **A:** No, new information can be presented as a question is being posed (**PQ**), during follow up after a question (**FUp**), when answering a student question (**AnQ**), etc. **Q:** When do I switch to coding **Lec** after coding **FUp**? **A:** Coders must pay close attention to the content during follow up to know if the instructor is still talking about the activity or moving on. Visual clues such as powerpoint slides can be indicators to know when follow up has ended and they have changed topics. **Q:** Does new content given during an instructor's question count as lecture? **A:** No, new content can be presented in many forms. If background information is given while posing a question, then **PQ** should be coded. **Q:** Can there be times when lecture won't be used during the entire class period? **A:** Yes, an instructor could go an entire class period without lecturing. For example, an instructor could use continuous group activities for the entirety of the class or the class period could be spent doing student presentations or taking a test. **Q:** When does information need to be coded as **Adm** and not **Lec**? **A: Adm** is only used when the instructor is not discussing information related specifically to course content, such as exam dates, assignment due dates, exam performance, tutoring opportunities, blackboard issues, student evaluation, surveys, etc.
RtW	**Quick Definition:** Real-time writing on board, document projector, etc. (often coded simultaneously with **Lec**). **Descriptions:** • Writing that is presented to the whole class, *not* individual students or small groups.

FUp	**Quick Definition:** Follow-up/feedback on clicker question or activity to entire class. **Descriptions** • Code as **FUp** when the instructor gave the group a clicker question or activity to work on, and then the instructor followed up on what they did/what happened. • When the instructor stops the **Fup** material and transitions on to new material, code as **Lec**. • Sometimes the instructor will provide feedback on actual responses to student work from a previous class period or from student work that was completed outside of class time. This should be coded as **FUp** because it is direct feedback to student responses. • However, if the instructor is simply reviewing material or general ideas from a previous class time, it should be counted as **Lec** instead. • **FUp** can also be coded with **PQ** at the same time if the instructor uses questions as part of the **FUp**. • If an instructor does use questions as part of the follow up, then **FUp** may also be coded with **AnQ**. • **FUp** and **Lec** should never be coded simultaneously but may appear in the same two minute time interval. **FAQ:** **Q:** When do I switch to coding **Lec** after coding **FUp**? **A:** Coders must pay close attention to the content during follow up to know if the instructor is still talking about the activity or moving on. Visual clues such as powerpoint slides can be indicators to know when follow up has ended and they have changed topics. **Q:** Can **FUp** only be used after a clicker question? **A:** No, **FUp** can be coded during follow up from the instructor as students work in groups on worksheets (**WG**) or another group activity (**OG**). **Q:** When the instructor asks the class a question as a part of a follow-up, do you code both **FUp** and **PQ**? **A:** Yes, **PQ** should always be coded when a question is asked. **Q:** What classifies as follow-up? For example, if the instructor shows clicker results but then doesn't give the answer or allow the students to try again. **A:** Anytime there is feedback after any type of activity. This includes *non-verbal feedback* like showing results or writing the answer on the board - even if it is just a portion of the answer. **Q:** If the instructor is still following up on a question when a new two minute segment starts, do you code **FUp** again? **A:** Yes, you should code for an activity throughout the duration, except under specific circumstances (e.g. an experiment that has been left and isn't being talked about).

PQ	**Quick Definition:** Posing non-clicker question to students (non-rhetorical) **Descriptions:** • This can include a question read to the group from a worksheet, a question for the students to answer in their course notebooks, or a generic "Any questions?" question *if the students have sufficient time to actually respond.* • This also includes a "raise your hand if…" question, and fill-in-the-blank questions such as "This is termed….". Mark the entire time that the students are responding to the question, not just when it is first asked. • **PQ** can also be coded with **FUp** if the instructor uses questions as part of the follow up. • New content presented to the class leading up to a question should be marked as **Lec.** • If new information is posed within the question OR if the information presented prior to the question is question-specific (e.g., when answering this question, keep in mind…), then mark as **PQ**, *not* **Lec**. • **PQ** and **Lec** should never be coded simultaneously but may appear in the same two minute time interval. **FAQ:** **Q:** If students are still working on a question when a new two minute segment starts, do you code **PQ** again? **A:** Yes, you should code for an activity throughout the duration, except under specific circumstances (e.g. an experiment that has been left and isn't being talked about). **Q:** Does new content given during an instructor's question count as lecture? **A:** No, new content can be presented in many forms. If background information is given while posing a question, then **PQ** should be coded. **Q:** When an instructor asks a question but doesn't allow the students to immediately start responding to it, do you code **PQ** when the question is asked or when the students are allowed to respond to it? **A:** Code **PQ** when the instructor asks the question. **Q:** What are some general rules for coding **PQ**? **A:** Make sure to code **PQ** throughout the duration of the activity, which will often be in conjunction with a worksheet or other group activity. For example, if they are working on a worksheet (**WG**) then you should also be coding **PQ** the whole time you are coding **WG**. However, if you overhear an instructor asking a small group a question while they are working on an activity (**MG**), *do not* code **PQ**. **PQ** only counts when the question is given to the entire class.

CQ	**Quick Definition:** Asking a clicker question **Descriptions:** • Other types of response system, such as online voting, ABCD cards, colored cards, or raising hands to vote *does not count* as **CQ**. • Mark **PQ** if question is not a clicker question. • If possible, note the type of clicker question in the notes section. • Make sure to mark the entire time the instructor is using a clicker question, not just when first asked. **FAQ:** **Q:** Do you code **CQ** if the question is up on the board, but the instructor is still in the process of giving background information for the upcoming question? **A:** Yes, background information and/or new information can be given in the process of asking a question. Visual clues are helpful to distinguish the difference between when a question is being posed or if the instructor is lecturing. **Q:** If students are still working on a clicker question when a new two minute time segment starts, do you code **CQ** again? **A:** Yes, you should code for an activity throughout the duration, except under specific circumstances (e.g. an experiment that has been left and isn't being talked about).
AnQ	**Quick Definition:** Listening to and answering student questions with the entire class listening
MG	**Quick Definition:** Moving through class guiding ongoing student work during an active learning task **Descriptions:** • This reflects the instructor moving through the groups, even if they spend more time with one group. • Also code this if one or more TAs circulate through groups on behalf of the primary instructor (make a note if possible). • If the instructor appears to ignore the other groups who need attention, then code as **1o1**. **FAQ:** **Q:** Do you wait for the professor/TAs to answer a question from a group before coding **MG**? **A:** The professor/TAs do not necessarily have to be answering questions for **MG** to be coded. You should start coding **MG** when the professor/TAs have started actively scanning and/or moving through the classroom to identify students with questions.

1o1	**Quick Definition:** One-on-one extended discussion with one or a few individuals (*students)* while not paying attention to the rest of the class **Descriptions:** • This is only used for instances where all the other students are waiting/listening to the instructor interact with one or a few individuals for an extended period of time (can occur simultaneously with **AnQ**). • This could occur during group work if the instructor is ignoring other groups who are waiting and/or listening to the instructor interact with one group or individual. • In general, this code would tend to have a negative connotation in contrast to a code such as **MG**, which would reflect interaction with the class. • **1o1** and **MG** should never be coded simultaneously but may appear in the same two minute time interval. • Having an extended **1o1** with the rest of the class listening does not occur frequently. **FAQ:** **Q:** What do I code if one TA spends extended time with one group, but at least one other TA is circulating? **A:** As long as one other TA or the professor is circulating, you code it as **MG**.
D/V	**Quick Definition:** Showing or conducting a demo, experiment, simulation, video, or animation. **Descriptions:** • Some instructors will have an ongoing experiment throughout a portion of the class period or the entire class period. If so, only code **D/V** when this demonstration or experiment is being specifically highlighted (e.g., discussion). • Music played as an example can also be considered **D/V**. • Someone holding up an example of an item is not considered **D/V**.
Adm	**Quick Definition:** Administration (assign homework, return tests, etc.) **Descriptions:** • Code when the instructor is providing information on things such as exam dates, assignment due dates, exam performance, tutoring opportunities, blackboard issues, student evaluation, surveys, etc. • If the instructor talks about learning objectives or provides an agenda during the class period, it should be coded as **Lec**. These types of items are related directly to the course content.

W	**Quick Definition:** Waiting when there is an opportunity for an instructor to be interacting with or observing/listening to student or group activities and the instructor is not doing so. **Descriptions:** • Do not code when instructor is giving students time to think or respond to a question, make a prediction, etc. • If there are multiple instructors or TAs in the room, do not code if at least one instructor/TA is interacting with the students. In that case, code the instructor/TA interacting with the students. • W is used to document if there is a missed opportunity to interact with students. For example, code **W** if the students are doing group work and all (if there is more than one) the instructors/TAs are not moving through the room listening or guiding the students along.
Si	**Quick Definition:** Stretch-it. Student follow up—a series of questions targeted to an individual student to really flush out their thinking on an idea or topic **<u>*This code is no longer used.</u>** This category is now included in the Instructor **PQ** definition for comparison with earlier COPUS data.
O	**Quick Definition:** Other – explain in comments **Descriptions:** • Use this code sparingly. If used multiple times, review other codes to see if they should be recoded in another category (or ignored). • Discuss with observation partner after class if possible.

Code	Student Engagement
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 Notes

We will estimate student engagement in order to support discussions with the instructors, but this will not be used in the aggregate data about the class as it is not quantified well enough by this instrument. When rating student engagement, only select one code for each 2-minute time interval. In general, assume that the students are engaged, if they are not doing something to indicate otherwise. For example, if they are looking at their computer screen, assume that it is for class content, unless you can see that they are looking at non-course related content.