

# SAGE 2YC

## 2YC Faculty as Agents of Change

<https://serc.carleton.edu/sage2yc/index.html>

### Context

The SAGE 2YC: Faculty As Change Agents project is building a national network of self-sustaining communities of 2YC geoscience faculty and administrators who use evidence-based strategies to improve all students' academic success, broaden participation, and facilitate students' professional pathways into the STEM workforce. A synergistic program of research and evaluation that is fully integrated in the project includes the development of two new inventories.

### Purpose of the Inventories

The purpose of each inventory is two-fold: to assist geoscience educators in self-assessing their educational practices, and to provide a list of evidence-based practices for supporting the academic success of all students, broadening participation in the geosciences, and facilitating the professional pathways of 2YC students. Either instrument can be used to trace changes over time through multiple applications.

### Educational Practices

The Inventory of Educational Practices focuses on evidence-based practices that individual faculty members can implement, both within and outside of the classroom. It has sections of questions about how often faculty incorporate active learning strategies; how often students engage in doing what scientists do; how often faculty incorporate metacognitive, motivational, and scaffolding strategies in their teaching; what kinds of opportunities faculty tell students about; and what actions faculty take to support students' professional pathways into the geosciences.

### Geoscience Department and Program Practices

The Inventory of Geoscience Department and Program Practices focuses on evidence-based practices that geoscience departments or programs can implement. It has sections of questions about course and program design and assessment; attracting students to your program; fostering a sense of belonging; supporting and engaging a diverse population of students; facilitating students' professional pathways into the geosciences; and departmental culture.

### Instruments Used in Developing the Inventories

Partnership for Undergraduate Life Sciences Education (PULSE) Vision and Change Rubrics

CWSEI Teaching Practices Inventory  
2016 National Survey of Geoscience Faculty

### Feedback

We invite your feedback on these instruments. Please see the handouts.



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# The Inventory of Educational Practices and the Inventory of Geoscience Department and Program Practices: Two new instruments in development from the SAGE 2YC Project

## Inventory of Educational Practices

Items related to **supporting student academic success** ask about what teaching methods faculty use, what students do in class, and how faculty structure courses to support student learning. For example:

Please indicate how frequently you incorporated the following within the course(s) that you taught last year. If you used different approaches in different courses, please average over all of your courses, to the best of your abilities:

	Nearly every session	Weekly	Several times a term	Once or twice a term	Never
Traditional lecture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrations, simulations, and/or videos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strategies to promote in-class student-to-student interactions, such as think-pair-share, small group discussions, debates	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Strategies to promote metacognition, such as minute papers, exam wrappers, or knowledge surveys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how frequently **students** do the following within the course(s) that you teach:

	Nearly every session	Weekly	Several times a term	Once or twice a term	Never
Use authentic data	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use quantitative skills to solve problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop and practice communication skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Analyze and solve problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practice geoscience skills in a field setting (e.g. collect their own field data)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thinking across all of the courses you taught last year, please indicate to what extent you did each of the following to support student learning:

	All or nearly all of my courses	Some of my courses	Rarely	Never
Inform students what I expect them to be able to do at the end of each activity or exercise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use instruction and activities that are based on students' prior knowledge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Connect course content to students' interests	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Items related to **broadening participation** ask about how faculty share information about opportunities for students and about strategies for mitigating stereotype threat. For example:

Please indicate to what extent you shared the following kinds of information with the students in your courses last year:

	I told all of the students in my courses	I told some of the students in my courses	I didn't tell students in my courses about these	I had no information to share on this topic
Opportunities to do research outside of class, with me or others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to do field work, with me or others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to give talks or posters on campus to an audience beyond the classroom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to attend professional society meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to present their work at professional society meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information about internship opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal invitations to discuss majoring in the geosciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thinking across all of the courses you taught last year, please indicate to what extent you did each of the following to support student learning:

	All or nearly all of my courses	Some of my courses	Rarely	Never
Showcase diverse geoscientists in course materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate how frequently you incorporated the following within the course(s) that you taught last year. If you used different approaches in different courses, please average over all of your courses, to the best of your abilities:

	Nearly every session	Weekly	Several times a term	Once or twice a term	Never
Set high standards and convey the expectation that all students will be able to meet them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Use validation techniques to build students' self-efficacy and confidence: e.g., point out how student behaviors will lead to success in the geosciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teach students self-affirmation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Items related to **facilitating students' professional pathways** ask about how faculty build students' awareness of geoscience careers and the pathways to those careers. For example:

Thinking across all of the courses you taught last year, please indicate to what extent you did each of the following to support student learning:

	All or nearly all of my courses	Some of my courses	Rarely	Never
Incorporate information on geoscience careers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporate assignments where students explore some aspect(s) of geoscience careers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Showcase diverse geoscientists in course materials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please indicate to what extent you share the following kinds of information with the students in your courses:

	I told all of the students in my courses	I told some of the students in my courses	I didn't tell students in my courses about these	I had no information to share on this topic
Opportunities to attend professional society meetings	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal invitations to discuss majoring in the geosciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information about career opportunities in geoscience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Examples of alumni from our institution who are working in geosciences	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data on entry-level salaries for various geoscience careers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information about what degrees are required for a variety of geoscience jobs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advising on transfer pathways	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To support students' professional pathways in the geosciences, I do the following:

	Yes	No
Invite alumni to discuss their job and career path, in class or in a public forum	<input type="checkbox"/>	<input type="checkbox"/>
Invite local geoscientists to discuss their job and career path, in class or in a public forum	<input type="checkbox"/>	<input type="checkbox"/>
Participate in college career fairs	<input type="checkbox"/>	<input type="checkbox"/>
Work with the career center (e.g. provide them with information about geoscience careers)	<input type="checkbox"/>	<input type="checkbox"/>
Work with the advising center (e.g. provide their staff with information about geoscience careers and pathways)	<input type="checkbox"/>	<input type="checkbox"/>

## Inventory of Geoscience Department & Program Practices

Items related to **supporting student academic success** ask about course and program design and assessment. For example:

Please characterize to what extent your geoscience department or program does the following things:

	Absent	Beginning	Developing	Accomplished	Exemplar
Uses data on student preparation and student interests in course design and revision	Evidence of student preparation and interests is not gathered	Evidence of student preparation and interests is gathered, but rarely used to inform course design	Evidence of student preparation and interests is gathered and occasionally used to inform course design	Evidence of student preparation and interests is gathered and often used to inform course design	Evidence of student preparation and interests is formally gathered; most instructors regularly revise their courses in response, to maximize learning
Uses formative assessments: low stakes, ungraded assessments, such as clicker questions or minute papers, for checking on student learning rather than for assigning grades	Formative assessments are not utilized	Some courses have formative assessments that measure learning outcome achievement	Many courses have formative assessments that measure learning outcome achievement	The majority of courses have formative assessments that measure learning outcome achievement	The majority of courses have formative assessments that measure learning outcome achievement as part of a coherent, evidence-based assessment plan
Has a written set of program-level learning outcomes/goals for students	Does not have program-level learning outcomes or goals for students	Has an unwritten set of program-level learning outcomes/goals for students	Has a draft set of program-level learning outcomes/goals for students	Has program-level learning outcomes and goals for students, and every faculty member knows what they are	Has program-level learning outcomes and goals for students, revisits them every 3-5 years, and course-level learning goals and outcomes are linked to them
Uses data on program effectiveness to inform program revisions	Program effectiveness is not evaluated	Program revision occurs only in response to indirect data on program effectiveness	Program revision occurs in response to indirect data and one source of direct data on program effectiveness	Program revision occurs in response to indirect data and 2-3 sources of direct data on program effectiveness	Program revision occurs in response to indirect data and 4 or more sources of direct data on program effectiveness

Items related to **facilitating students' professional pathways** ask about how faculty build students' awareness of geoscience careers and the pathways to those careers. For example:

Please indicate to what extent your geoscience department or program has the following:

	Absent	Beginning	Developing	Accomplished	Exemplar
A handout or other resource for staff at your campus career center &/or advising center, outlining career opportunities in geoscience and the pathways to those careers	We don't have such resources	We have this information, but it has not been updated for several years	We have this information, and it is up-to-date, but we haven't shared it with others on campus	We have this information, and we update it periodically and share it with others on campus	We have this information, update it annually, and we update it with multiple campus offices
A database or other means of staying in touch with alumni	We don't have this	We have some contact info for some alumni, but no mechanism for keeping it up-to-date	We have some contact info for some alumni, and plan to collect it routinely in the future	We have contact info for many alumni, and we try to keep it up to date	We have a strong alumni network, and they keep us informed when their contact info changes
Joint activities with target transfer institution(s) – e.g. field trips, seminars, guest speakers, shared courses	We do not have joint activities with transfer institutions	We have had joint events with transfer institutions in the past	We have at least one joint event with one or more transfer institutions each year	We have at least one joint event with one or more transfer institutions each term	We have at least one joint event with one or more transfer institutions each term, and they are well-attended
Written guidelines for students planning to transfer to a 4YU geoscience program, outlining the courses and activities we recommend for them prior to transfer	We do not have written guidelines for this	We are in the process of drafting written guidelines for students planning to transfer to a 4YU geoscience program	We have written guidelines for students planning to transfer, but we do not keep them up to date	We have written, up to date guidelines for students planning to transfer	We have written guidelines for students planning to transfer, and we update them every year

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Items related to **broadening participation** ask about how the department or program engages and supports a diverse population of students and fosters a sense of belonging. For example:

Please characterize to what extent your geoscience department or program has the following:

	Absent	Beginning	Developing	Accomplished	Exemplar
Departmental events for students are designed to maximize accessibility (e.g. affordable, providing daycare, food that meets dietary restrictions, etc.)	We do not have departmental events for students	There are many barriers to participating in departmental events for students (e.g. cost, no daycare, timing, etc.)	We ask students to let us know if they need any accommodations for departmental events	We design events for students to be accessible (e.g. affordable, with a variety of food options)	We design events for students to maximize accessibility (e.g. affordable, providing daycare, food that meets dietary restrictions, etc.)
A written statement, displayed publicly, that affirms that your department/program values diversity	We do not have a written statement that affirms that we value diversity	We are in the process of drafting a statement that affirms that we value diversity	We have a statement that affirms that we value diversity, but it is not displayed publicly	We have a statement that affirms that we value diversity, and it is displayed publicly	We have a statement that affirms that we value diversity. In addition to displaying it publicly, we include it in our course syllabi
An awareness of your institution's policy and procedure for addressing incidents of sexual harassment and assault	None of the faculty members know what the policies and procedures are	A few of the faculty members know what the policies and procedures are and inform their students about those policies and procedures	A core of faculty members know what the policies and procedures are, and some inform their students about those policies and procedures	A majority of the faculty members know what the policies and procedures are and inform their students about those policies and procedures	Nearly every faculty member knows what the policies and procedures are and how to report incidents, and informs their students about those policies and procedures
An awareness and understanding of implicit bias and stereotype threat and their effects on student learning	None of the faculty can explain how implicit bias and stereotype threat affect student learning	A few of the faculty can explain how implicit bias and stereotype threat affect student learning	A core group of faculty members can explain how implicit bias and stereotype threat affect student learning	A majority of faculty members can explain how implicit bias and stereotype threat affect student learning	Nearly all of the faculty members can explain how implicit bias and stereotype threat affect student learning, and consider these factors in planning their teaching

This inventory also has a set of questions about **departmental culture**. For example:

Please indicate to what extent your geoscience department or program does the following:

	Absent	Beginning	Developing	Accomplished	Exemplar
Facilitates faculty learning from each other	Faculty do not have opportunities to learn from each other	A few of the faculty learn from each other through casual conversations or by observing each other's teaching	A core group of faculty members regularly engage in conversations about teaching, and occasionally observe each other's teaching	A majority of faculty members routinely engage in learning from each other via conversations and classroom teaching observations	Nearly all of the faculty members, including adjunct faculty, routinely engage in learning from each other via conversations and classroom teaching observations
Makes curricular and programmatic decisions	We have not discussed our curriculum or program in the past five years	A small subset of the faculty make all of the curricular and programmatic decisions	A core group of faculty members make all of the curricular and programmatic decisions	A majority of the faculty members, including some adjunct faculty, work together to make curricular and programmatic decisions	Nearly all of the faculty members, including adjunct faculty, work together to make curricular and programmatic changes
Mentors new permanent faculty	New faculty members receive no mentoring	New permanent faculty members are assigned a mentor and encouraged to ask that person if they have questions	New permanent faculty members are assigned a mentor and encouraged to meet with him/her on a regular basis	A core group of faculty members periodically offer to meet with each new permanent faculty member to check in and answer questions	Most of the faculty members routinely and periodically offer to meet with each new permanent faculty member to check in and answer questions
Mentors new adjunct faculty	New adjunct faculty members receive no mentoring	New adjunct faculty members are assigned a mentor and encouraged to ask that person if they have questions	New adjunct faculty members are assigned a mentor and encouraged to meet with him/her on a regular basis	A core group of faculty members periodically offer to meet with each new adjunct faculty member to check in and answer questions	Most of the faculty members routinely and periodically offer to meet with each new adjunct faculty member to check in and answer questions