PDP ACTIVITY DESIGN TEMPLATE

Teams will design or re-design an inquiry activity where students simultaneously learn scientific knowledge, reasoning processes, and attitudes, by practicing science or engineering. Designs should reflect consideration for contemporary issues in education, including diversity/equity and results from research (such as the *How People Learn* series of summaries).

BACKGROUND

GOALS

EVIDENCE

ACTIVITY DESCRIPTION

SYNTHESIS

RATIONALE

FACILITATION

The KNOWLEDGE-CENTERED LENS

Teams will design or re-design an inquiry activity where students simultaneously learn scientific knowledge, reasoning processes, and attitudes, by practicing science or engineering. Designs should reflect consideration for contemporary issues in education, including diversity/equity and results from research (such as the *How People Learn* series of summaries).

BACKGROUND

Do the learners have prior conceptions related to this activity? Are the learners likely to have prior misconceptions? (eg: seasons are caused by distance from the Sun)

Do the learners have something in their background that is useful prior knowledge, that should be leveraged in the activity? (eg: wave concepts of amplitude, frequency, wavelength closely related to the "surf report" of height and period)

GOALS

Do the goals accurately reflect what is important for learners to gain and understand?

Are the goals focused on connected knowledge, organized around fundamental ideas, concepts, and skills?

EVIDENCE

Can you gather evidence to measure real understanding and not just rote memorization?

Can you gather evidence on the use and application of knowledge, or perhaps the transfer knowledge and understanding to another context or application?

Are you able to gather evidence that shows your students are learning and applying new skills? (in addition to learning and applying new ideas)

ACTIVITY DESCRIPTION

Does the activity allow sufficient time for learners to reflect and gain deep understanding?

Are there opportunities for learners to learn metacognitive strategies related to the content?

Does the activity emphasize empirical evidence and reasoning from such evidence?

SYNTHESIS

Does the synthesis tie together different learners' investigative paths to show common concepts and knowledge?

Does the synthesis stress the knowledge goals that are truly important? What "enduring understanding" should be synthesized?

TIME

RATIONALE

FACILITATION

Are there areas of the activity that facilitators can keep in their "back pockets" to challenge learners who need an extra push?

The LEARNER-CENTERED LENS

Teams will design or re-design an inquiry activity where students simultaneously learn scientific knowledge, reasoning processes, and attitudes, by practicing science or engineering. Designs should reflect consideration for contemporary issues in education, including diversity/equity and results from research (such as the *How People Learn* series of summaries).

BACKGROUND

What past experiences do your learners bring to the activity?

Is there something in your learners' backgrounds that connects with the activity?

GOALS

Are the goals matched appropriately to the learners' levels of knowledge, skills, and attitudes?

Are the learners motivated to achieve these goals?

EVIDENCE

Are you looking for a variety of kinds of evidence, to gather information about a diversity of learners?

ACTIVITY DESCRIPTION

Are you planning to use several different teaching styles and techniques for a diversity of learners?

Are you also planning to use differing participant structures (for instance group work, pair work, individual work, etc) for a diversity of learners?

Will the activity emphasize that the skills, knowledge, and attitudes are learned rather than fixed or innate?

Are there multiple ways for learners to get to the goals of the activity?

SYNTHESIS

Is there a way to connect the synthesis of the activity with the learners' everyday lives?

Will the synthesis respect the work of the learners? Can the synthesis make specific reference to their contributions?

T I M E

RATIONALE

FACILITATION

Do the facilitation plans emphasize the importance of respecting the learners and their work?

Can the activity be learner-driven rather than facilitator-intervention-driven?

The ASSESSMENT-CENTERED LENS

Teams will design or re-design an inquiry activity where students simultaneously learn scientific knowledge, reasoning processes, and attitudes, by practicing science or engineering. Designs should reflect consideration for contemporary issues in education, including diversity/equity and results from research (such as the *How People Learn* series of summaries).

BACKGROUND

Is there any data you can gather or would like to gather about your learners beforehand, that would help you during the activity?

What kinds of assessment and self-assessment are your learners likely to be familiar with and expecting?

GOALS

Should you include goals of self-monitoring, self-assessment, and metacognitive strategies?

EVIDENCE

What is the evidence you will look for that shows your students meeting goals or progressing toward them?

Is the evidence really measuring your goals?

Have you considered a variety of assessment methods in order to gather evidence about your students' progress in all of your goals?

Are the assessments driving the learning, and if so, is that what you want? (ex: are you "teaching the test"?)

ACTIVITY DESCRIPTION

Are there components in the activity that allow learners to assess their progress for themselves?

Does the activity provide learners with opportunities to revise and improve their thinking?

SYNTHESIS

At the end of the activity, do the learners have a good idea of their strengths and weaknesses?

TIME

RATIONALE

FACILITATION

Are there ways to incorporate "formative assessment" -- that is, are there opportunities for facilitators to judge if learners are making progress?

Are the facilitators equipped to adjust the activity or their facilitation based on formative assessment?

The COMMUNITY-CENTERED LENS

Teams will design or re-design an inquiry activity where students simultaneously learn scientific knowledge, reasoning processes, and attitudes, by practicing science or engineering. Designs should reflect consideration for contemporary issues in education, including diversity/equity and results from research (such as the *How People Learn* series of summaries).

BACKGROUND

What do you know about the values and norms of the learners' larger communities?

What sort of learning-community has been established (if any) for your learners before they enter your activity?

GOALS

Are there ways to connect your goals to learners' outside communities?

Are you including goals that build a supportive community of learning in the venue your activity is situated within?

Do your goals include bringing learners into the community and culture of scientific practice, with its norms and values? (eg: respect for evidence, critical questioning, risk-taking)

EVIDENCE

Can the community of learners within this activity monitor their own progress, assess themselves, or contribute to the evidence of their own understanding?

ACTIVITY DESCRIPTION

Does the activity encourage the sorts of community values you want to emphasize? For instance, does the activity reward learners for taking risks and exploring their own ideas, rather than punishing them or discouraging them for designing a "failed" experiment?

Will the activity highlight positively the community's diversity of pathways through investigations and toward the goals?

If there are these multiple paths to the goals, are there some paths that particularly resonate with learners' other communities?

T I M E

SYNTHESIS

Will the synthesis tie together learners' individual or small-group work into the collective work of the classroom community?

Can the synthesis continue to bring learners into the community of science practice, by for instance encouraging respectful argument and skepticism?

RATIONALE

FACILITATION

Are there particular facilitation moves that can help develop the community of learning you want to grow?

Can facilitators help make it clear when it's appropriate to step in and out and among these various communities?

Are there particular facilitation moves that can help bring learners into the community of science?