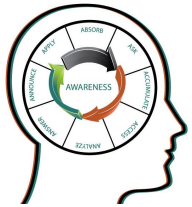

Develop Your Data Mindset

Module 3 - Aligning Answerable Questions With School Initiatives
Part 2 - Aligning Answerable Questions With School Initiatives

By Nathan Anderson, Amy Ova, Wendy Oliver, and Derrick Greer

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Learning Goals

- Increase knowledge of questions that can be answered with data
- Increase knowledge of data use for formative purposes
- Increase knowledge of data use for summative purposes

SLDS Data Use Standards

- K.1.A Question Formation: Knows which questions can be answered with data and how to identify the nature and extent of the data needed to answer the questions
- S.3.C Multiple Measures: Uses multiple measures (e.g., formative, summative, growth measures, etc.) appropriately

Making Questions Answerable

Ryan Kelly:
Now we have an understanding of common data-focused questions posed in educational settings; however, they're not quite **operationalized** (that is, they're not written in an answerable way). Let's spend a little time to operationalize one of these questions or, in other words, make it answerable.

- Which students are at risk for poor learning or need enrichment?
- Is a student progressing toward an end-of-year goal?
- Which areas represent a student's strengths and skill deficits?
- Which students know or do not know what needs to be known relevant to the current lesson?
- Is a student performing at/above/below the expected level of performance at the end?
- Is a program/strategy/intervention reaching the intended audience?
- Is a program/strategy/intervention implemented as planned?
- Does a class know what needs to be known relevant to the current lesson?
- What is the performance level for a group of students?
- Which areas are above/below the expected level of performance for a group?
- Which areas show a positive/negative trend in performance for a group?
- Which areas indicate the overall highest/lowest levels of performance for a group?
- Which subgroup(s) show a trend toward increasing/decreasing performance?
- Between which subgroup(s) is the achievement gap closing/ becoming greater?

Making Questions Answerable

Carolyn Ross:
What do you mean they're not answerable? It seems like all the questions can be answered. Like, if I ask the question, "Is the program or strategy having the desired effect?" an answer could be "yes, it is having the desired effect" or "no, it is not having the desired effect."

Ryan Kelly:
Well, you're right that the answer could be yes or no, but in order to make it answerable with data, it needs to be written in a way that defines the desired effect and specifies how it will be measured. By operationalizing the question -- while in the ask stage of the A+ Inquiry framework -- you are demonstrating awareness of the Accumulate, Analyze, and Answer stages.

Making Questions Answerable

Ryan Kelly:
Let's look at an example we worked on last year at Great Plains and then you will practice some of your own. Last year our data team at Great Plains formulated an operationalized (i.e., answerable) question by beginning with one general evaluation question regarding the impact of a reading intervention on a group of students who participated in the intervention program. We started with the general evaluation question, "Is the program, strategy, or intervention having the desired impact?" The question was no answerable as written so we refined the question until it became operational, as follows.

Example - Great Plains Operationalizes a Question

- Version 1 - Is the program, strategy, or intervention having the desired impact?
- Version 2 - Is the reading intervention having a positive impact on student reading achievement?
  - In this step, they refined the definition of “program, strategy, or intervention” as a “reading intervention” and the definition of “desired impact” as “a positive impact on student reading achievement.”
- Version 3 - Is student reading achievement greater after the intervention than before the intervention?
  - In this step, they began to specify the timeframe that would be required to measure the increase, indicating they needed to measure reading achievement before the intervention and after the intervention and then calculate the difference between the pre-intervention and post-intervention reading measures.

Example - Great Plains Operationalizes a Question

- Version 4 - Is the student reading performance on the spring NWEA MAP assessment greater than student reading performance on the fall NWEA MAP assessment?
  - In this step, they specified the assessments that would be used to measure reading performance (that is, fall and spring NWEA MAP reading assessments)

- Version 5 - Is the average student percentile on the spring NWEA MAP reading assessment greater than the average student percentile on the fall NWEA MAP reading assessment?
  - In this step they specified that reading performance of the intervention participants would be measured using average percentile in the fall and average percentile in the spring and then then the percentiles would be compared to evaluate whether the spring average percentile is greater than the fall average percentile.

The question in the final bullet is operationalized (i.e., answerable) because it indicates which data are required to answer the question and how the data will be analyzed.

Activity - 03.02.01

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: What was each student's performance level?

- (1, 2, 3, 4) What was each student's percentile on an interim reading assessment?
- (1, 2, 3, 4) What was each student's percentile on an interim assessment?
- (1, 2, 3, 4) What was each student's percentile on the fall interim reading assessment of the current year?
- (1, 2, 3, 4) What was each student's percentile?

Activity - 03.02.01 - Answer

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: What was each student's performance level?

- (1, 2, 3, 4) What was each student's percentile on an interim reading assessment?
- (1, 2, 3, 4) What was each student's percentile on an interim assessment?
- (1, 2, 3, 4) What was each student's percentile on the fall interim reading assessment of the current year?
- (1, 2, 3, 4) What was each student's percentile?

Activity - 03.02.02

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Is an intervention reaching the intended audience?

- (1, 2, 3, 4) Is a math intervention being administered to 80% of the students who meet the criteria for the intervention?
- (1, 2, 3, 4) Is a math intervention reaching the intended audience?
- (1, 2, 3, 4) Is a math intervention being administered to students who meet the criteria for the intervention?
- (1, 2, 3, 4) Is a math intervention being administered to at least 80% of the students whose risk statuses were confirmed through progress monitoring?

Activity - 03.02.02 - Answer

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Is an intervention reaching the intended audience?

- (1, 2, 3, 4) Is a math intervention being administered to 80% of the students who meet the criteria for the intervention?
- (1, 2, 3, 4) Is a math intervention reaching the intended audience?
- (1, 2, 3, 4) Is a math intervention being administered to students who meet the criteria for the intervention?
- (1, 2, 3, 4) Is a math intervention being administered to at least 80% of the students whose risk statuses were confirmed through progress monitoring?

Activity - 03.02.03

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Does a class know what needs to be known relevant to the current lesson?

- (1, 2, 3, 4) Did 100% of students in a class give a thumbs up to indicate they understood the learning target being taught in the current science lesson?
- (1, 2, 3, 4) Did the students in a class indicate they understood the learning target taught in the current science lesson?
- (1, 2, 3, 4) Did the students in a class give a thumbs up to indicate they understood the learning target being taught in the current science lesson?
- (1, 2, 3, 4) Did the students in a class indicate they understood a concept being covered in the current science lesson?

Activity - 03.02.03 - Answer

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Does a class know what needs to be known relevant to the current lesson?

- (1, 2, 3, 4) Did 100% of students in a class give a thumbs up to indicate they understood the learning target being taught in the current science lesson?
- (1, 2, 3, 4) Did the students in a class indicate they understood the learning target taught in the current science lesson?
- (1, 2, 3, 4) Did the students in a class give a thumbs up to indicate they understood the learning target being taught in the current science lesson?
- (1, 2, 3, 4) Did the students in a class indicate they understood a concept being covered in the current science lesson?

Activity - 03.02.04

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Which areas are above the expected level of performance?

- (1, 2, 3, 4) Which subject areas represent a high enough percentage of students at or above proficiency on the state assessment?
- (1, 2, 3, 4) Which subject areas are above the expected level of performance on the state assessment?
- (1, 2, 3, 4) Which subject areas are above the expected level of performance?
- (1, 2, 3, 4) Which subject areas represent more than 80% of students in a district at or above proficiency on the state assessment?

Activity - 03.02.04 - Answer

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Which areas are above the expected level of performance?

- (1, 2, 3, 4) Which subject areas represent a high enough percentage of students at or above proficiency on the state assessment?
- (1, 2, 3, 4) Which subject areas are above the expected level of performance on the state assessment?
- (1, 2, 3, 4) Which subject areas are above the expected level of performance?
- (1, 2, 3, 4) Which subject areas represent more than 80% of students in a district at or above proficiency on the state assessment?

Activity - 03.02.05

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Is a program having the desired effect?

- (1, 2, 3, 4) Is the annual curriculum having the desired effect in the area of reading?
- (1, 2, 3, 4) Is student performance in reading greater at the end of the school year than at the beginning of the school year?
- (1, 2, 3, 4) Is the annual curriculum having the desired effect?
- (1, 2, 3, 4) Is the average reading percentile of students greater on the spring interim assessment than on the fall interim assessment?

Activity - 03.02.05 - Answer

Read the general question, and then rank the four subsequent questions in order from least (1) to most (4) operationalized.

General question: Is a program having the desired effect?

- (1, 2, 3, 4) Is the annual curriculum having the desired effect in the area of reading?
- (1, 2, 3, 4) Is student performance in reading greater at the end of the school year than at the beginning of the school year?
- (1, 2, 3, 4) Is the annual curriculum having the desired effect?
- (1, 2, 3, 4) Is the average reading percentile of students greater on the spring interim assessment than on the fall interim assessment?

Making Questions Answerable

Ryan Kelly:
Now that you have practiced, let's help the evaluation team formulate an operationalized (i.e., answerable) question regarding the impact of a teacher professional development program on student achievement.

Activity - 03.02.06

Select the operationalized or answerable version of the following question: Did the teacher professional development program have a positive impact on student reading achievement?

- Were the teachers better at providing reading instruction during the professional development year?
- What was the percentage of students who met fall to spring NWEA MAP Reading RIT projected growth during the teacher professional development program year?
- Was the % of students meeting or exceeding fall to spring NWEA MAP Reading RIT projected growth during the teacher professional development program year significantly greater than the % of students of the same teacher meeting or exceeding fall to spring NWEA MAP Reading RIT projected growth during the prior year?
- Does the x-ray show anything of concern?

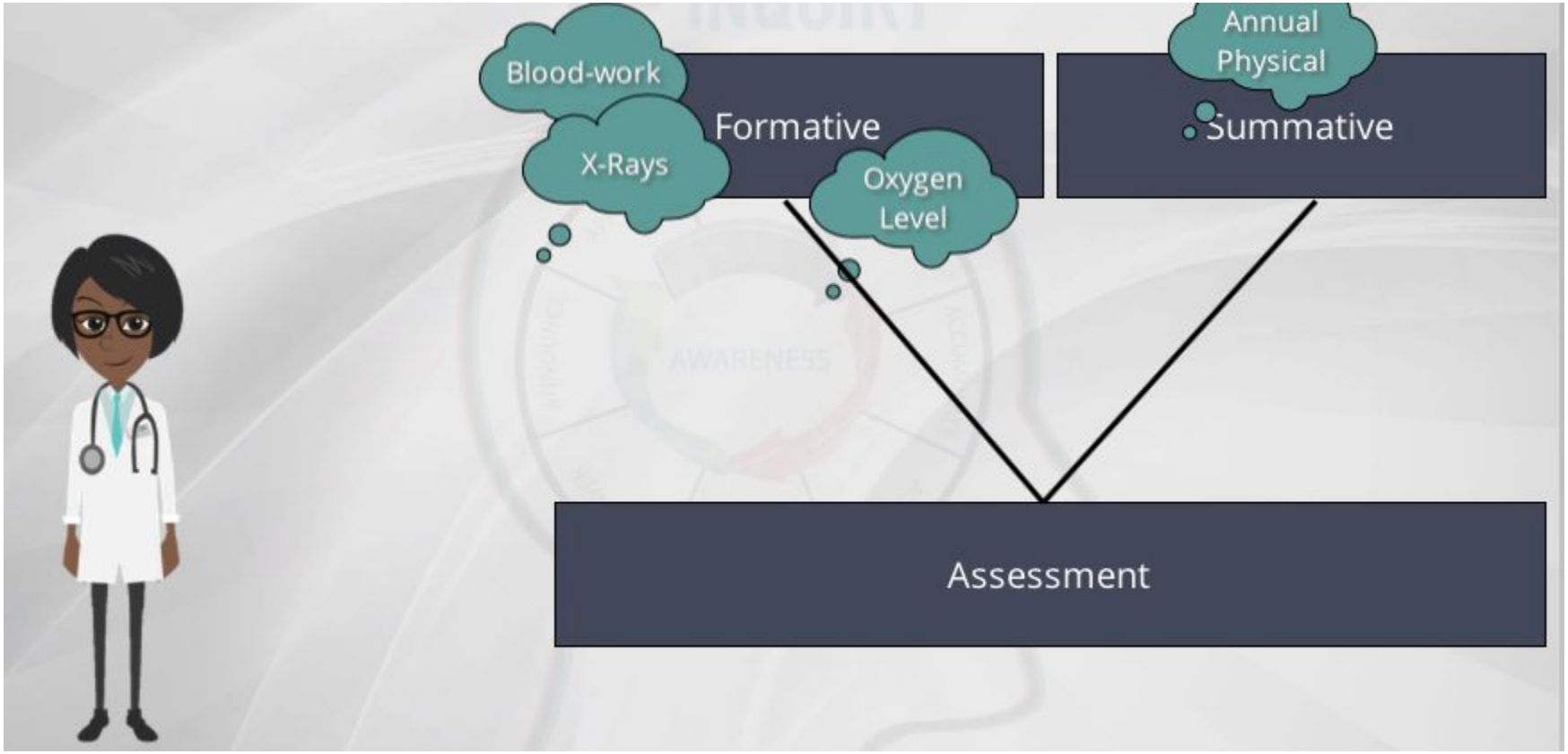
Activity - 03.02.06 - Answer

Select the operationalized or answerable version of the following question: Did the teacher professional development program have a positive impact on student reading achievement?

- Were the teachers better at providing reading instruction during the professional development year?
- What was the percentage of students who met fall to spring NWEA MAP Reading RIT projected growth during the teacher professional development program year?
- Was the % of students meeting or exceeding fall to spring NWEA MAP Reading RIT projected growth during the teacher professional development program year significantly greater than the % of students of the same teacher meeting or exceeding fall to spring NWEA MAP Reading RIT projected growth during the prior year?
- Does the x-ray show anything of concern?

Assessment Data

Let's look at the next step after you have operationalized your questions: determining the type of assessment data to accumulate.



Activity - 03.02.07

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

A fall NWEA MAP assessment used for universal screening

- True
- False

Activity - 03.02.07 - Answer

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

A fall NWEA MAP assessment used for universal screening

- True
- False

Activity - 03.02.08

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

A quiz given to students prior to the end-of-unit test to identify which areas in the unit may require reteaching

- True
- False

Activity - 03.02.08 - Answer

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

A quiz given to students prior to the end-of-unit test to identify which areas in the unit may require reteaching

- True
- False

Activity - 03.02.09

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

Analyzing spring NWEA MAP assessment results compared to fall NWEA MAP assessment results to determine if a yearly growth goal was achieved

- True
- False

Activity - 03.02.09 - Answer

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

Analyzing spring NWEA MAP assessment results compared to fall NWEA MAP assessment results to determine if a yearly growth goal was achieved

- True
- False

Activity - 03.02.10

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

An aimsweb probe used for progress monitoring

- True
- False

Activity - 03.02.10 - Answer

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

An aimsweb probe used for progress monitoring

- True
- False

Activity - 03.02.11

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

Administering an end of unit test to students to determine whether they possess knowledge that was intended to be acquired by the end of the unit

- True
- False

Activity - 03.02.11 - Answer

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

Administering an end of unit test to students to determine whether they possess knowledge that was intended to be acquired by the end of the unit

- True
- False

Activity - 03.02.12

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

A Renaissance STAR assessment used for diagnostic purposes

- True
- False

Activity - 03.02.12 - Answer

Let’s look at the next step. Can you identify formative data? Select true if the example is formative data and false if it is not.

A Renaissance STAR assessment used for diagnostic purposes

- True
- False

Activity Review - 03.02.07-03.02.12

Formative Data

- A fall NWEA MAP assessment used for universal screening
- A quiz given to students prior to the end of unit test
- An aimsweb probe used for progress monitoring
- A Renaissance STAR assessment used for diagnostic purposes

Summative Data

- Analyzing spring NWEA MAP assessment results compared to fall NWEA MAP assessment results to determine if a yearly growth goal was achieved
- Administering an end of unit test to students

Activity - 03.02.13

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

A teacher collecting exit slips at the end of a subject period to inform instruction that will be delivered the following day

- True
- False

Activity - 03.02.13 - Answer

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

A teacher collecting exit slips at the end of a subject period to inform instruction that will be delivered the following day

- True
- False

Activity - 03.02.14

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

A teacher collecting exit slips at the end of a subject period to inform instruction that will be delivered the following day

- True
- False

Activity - 03.02.14 - Answer

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

A teacher collecting exit slips at the end of a subject period to inform instruction that will be delivered the following day

- True
- False

Activity - 03.02.15

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

A teacher completing an observation rubric during student work time to determine which areas may require re-teaching during the current or future lessons

- True
- False

Activity - 03.02.15 - Answer

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

A teacher completing an observation rubric during student work time to determine which areas may require re-teaching during the current or future lessons

- True
- False

Activity - 03.02.16

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

An interventionist progress monitoring a student after an intervention has been assigned to determine whether the intervention should be adjusted

- True
- False

Activity - 03.02.16 - Answer

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

An interventionist progress monitoring a student after an intervention has been assigned to determine whether the intervention should be adjusted

- True
- False

Activity - 03.02.17

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

Analyzing Lexile reader measures obtained through the winter NWEA MAP Reading assessment to inform the selection of appropriately leveled reading materials

- True
- False

Activity - 03.02.17 - Answer

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

Analyzing Lexile reader measures obtained through the winter NWEA MAP Reading assessment to inform the selection of appropriately leveled reading materials

- True
- False

Activity - 03.02.18

Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

The ACT assessment given to students their junior or senior year to measure whether they are academically ready for college by the end of high school.

- True
- False

Activity - 03.02.18 - Answer

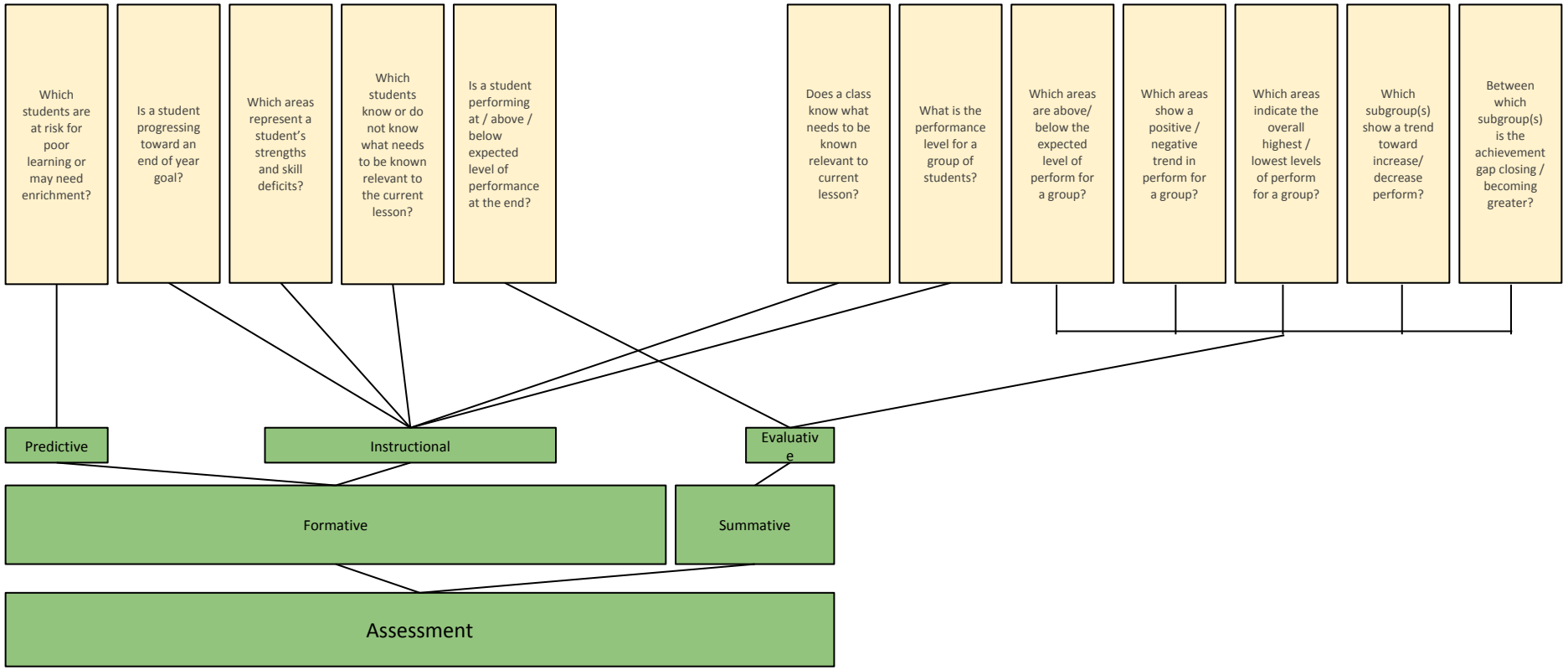
Now, let's see if you can identify summative data. Select true if the example is summative and false if it is not.

The ACT assessment given to students their junior or senior year to measure whether they are academically ready for college by the end of high school.

- True
- False

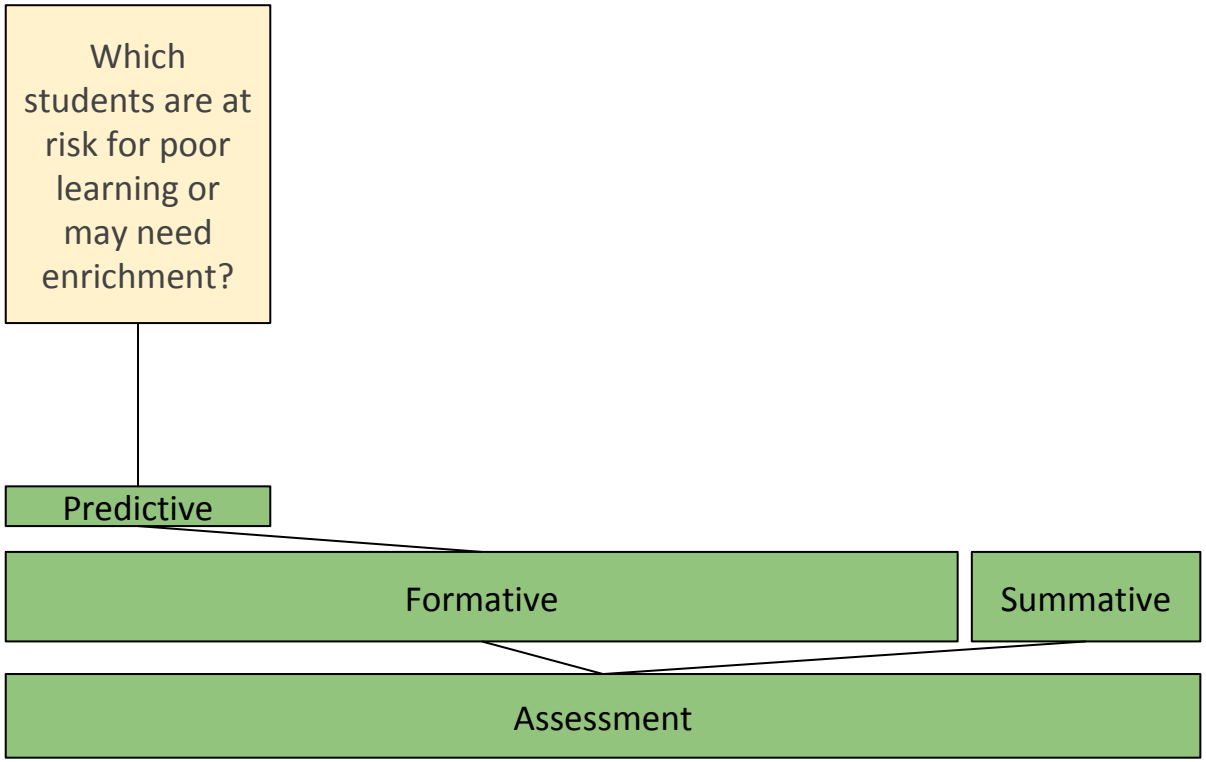
Assessment - Predictive, Instructional, Evaluative

Let's go back to the questions you asked from earlier. Remember these? Now, let's consider what type of data they are. Are they predictive, instructional or evaluative?



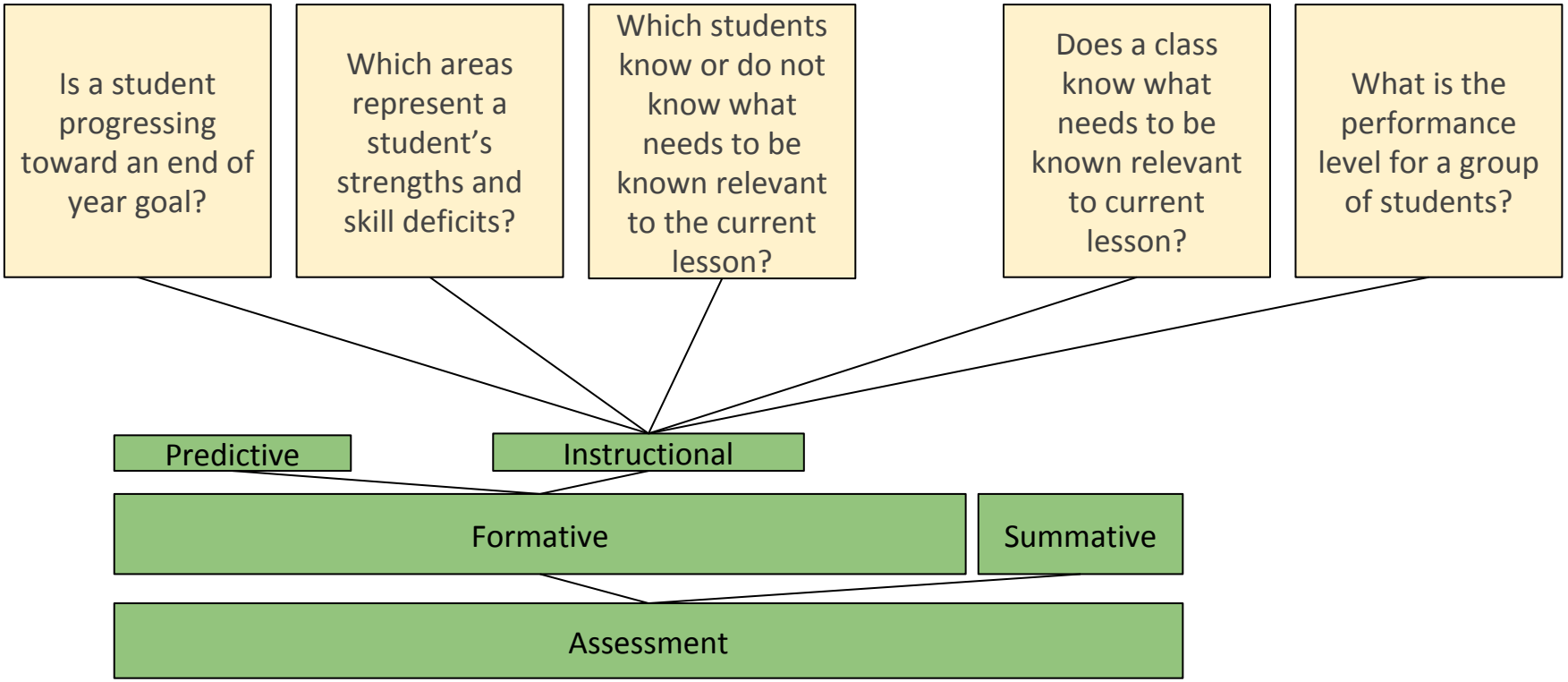
Assessment - Predictive

Predictive data is utilized to predict whether a student will achieve proficiency on an end-of-year test and includes proactive intervention planning. If someone had a Pneumonia vaccine, you would have an idea of whether he or she would come down with Pneumonia later.



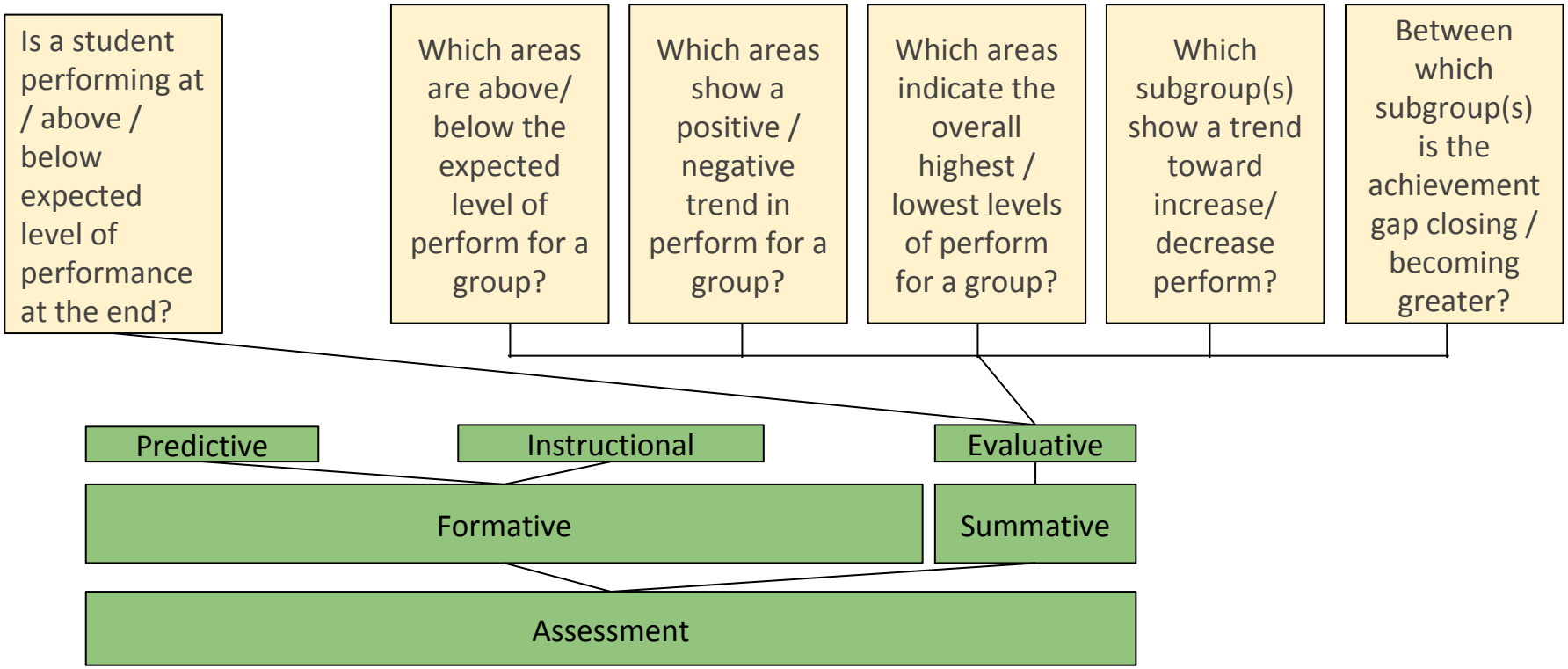
Assessment - Instructional

Instructional data is utilized to make curricular and instructional adjustments to better meet the needs of current students and includes diagnostic, growth, and pacing. With a Pneumonia case a doctor may measure whether a specific antibiotic is working to reduce the illness.



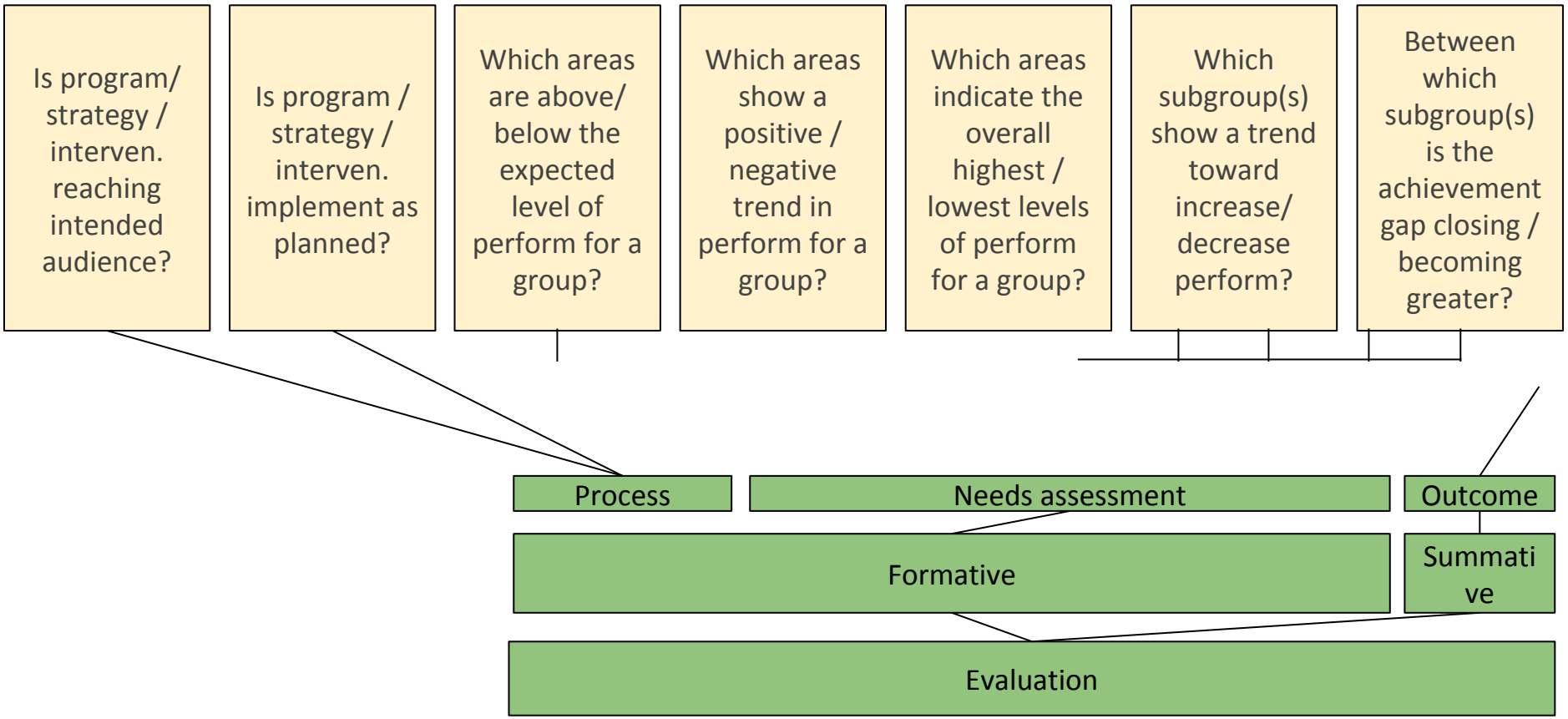
Assessment - Evaluative

Evaluative data is utilized to make a judgment about the effectiveness of a program or strategy and includes achievement placement, grades, and promotion to the next grade. With Pneumonia a doctor may measure the overall effectiveness of treatment to decide if the course of treatment was best.



Evaluation

Let's do the same thing with evaluation that we did with assessment. It is essential to know the types of data you need to answer your questions.



Assessment

Ryan Kelly:
Coach Smith, have you noticed anything that data and a balanced assessment approach have in common with wellness?

Coach Smith:
I never thought about it, but just like everything in the human body is connected, so are data, assessment and evaluation. In many ways, just like doctors use data to evaluate, assess, and diagnose the human body, we use the same strategies for multi-tier instruction to personalize learning. We have all these tools in front of us to help us diagnose what is happening in the brain as students learn.

Activity

Match the tools below with the correct bag.

RTI, NDMTSS, and AdvancED
Stethoscope
Stethoscope
Blood Work
X-Ray
Balanced Assessment System and Data Use Calendar
SLDS Data Standards and A+ Inquiry
Oxygen Level

Teacher's Briefcase

Doctor's Bag

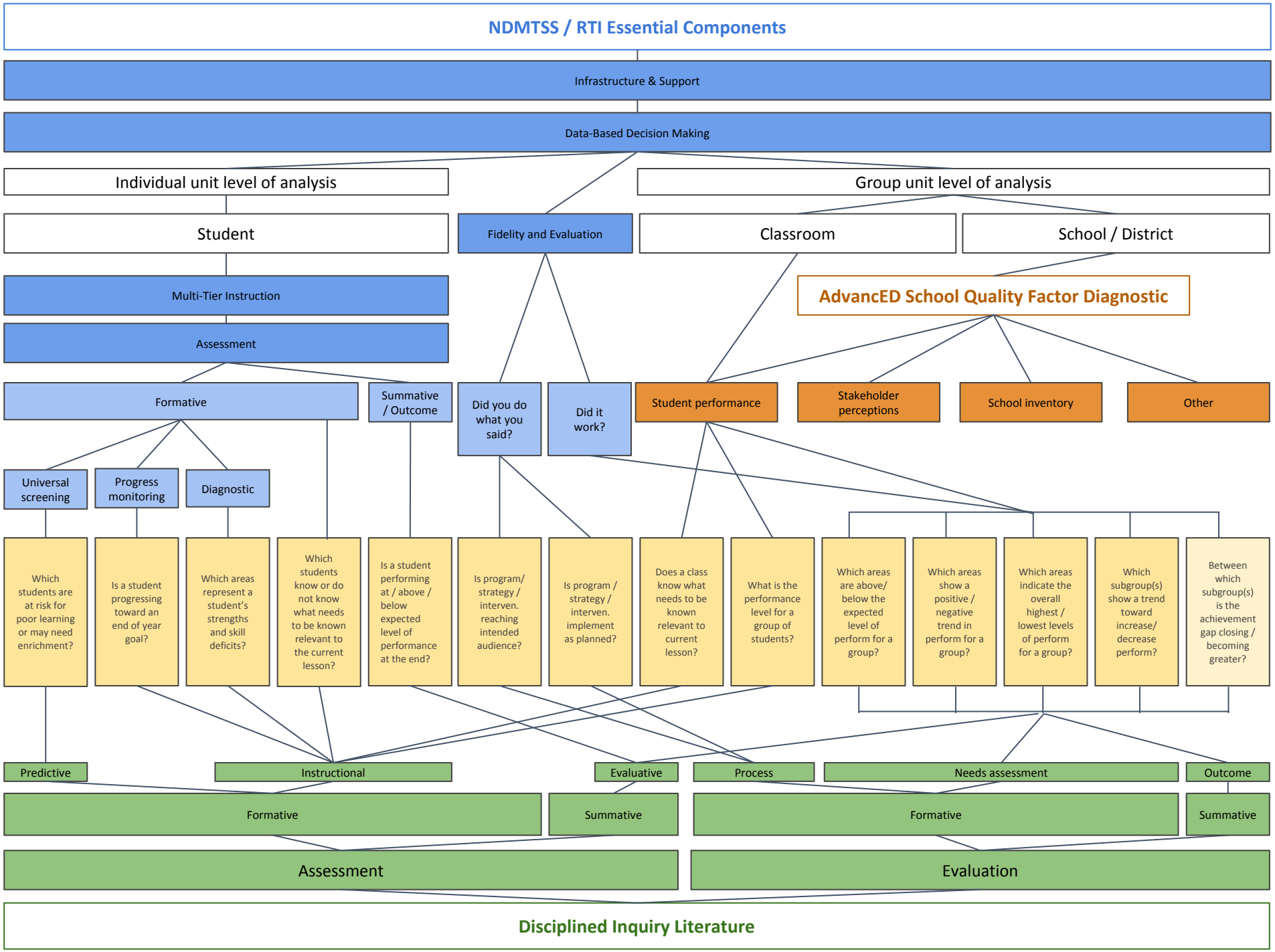
Activity Answer

Match the tools below with the correct bag.

- RTI, NDMTSS, and AdvancED
- Stethoscope
- Stethoscope
- Blood Work
- X-Ray
- Balanced Assessment System and Data Use Calendar
- SLDS Data Standards and A+ Inquiry
- Oxygen Level

Teacher's Briefcase

Doctor's Bag


NDMTSS / RTI Essential Components
Infrastructure & Support
Data-Based Decision Making
Individual unit level of analysis
Group unit level of analysis
Student
Fidelity and Evaluation
Classroom
School / District
Multi-Tier Instruction
AdvancED School Quality Factor Diagnostic
Assessment
Formative
Summative / Outcome
Did you do what you said?
Did it work?
Student performance
Stakeholder perceptions
School inventory
Other
Universal screening
Progress monitoring
Diagnostic
Which students are at risk for poor learning or may need enrichment?
Is a student progressing toward an end of year goal?
Which areas represent a student's strengths and skill deficits?
Which students know or do not know what needs to be known relevant to the current lesson?
Is a student performing at / above / below expected level of performance at the end?
Is program/ strategy / interven. reaching intended audience?
Is program / strategy / interven. implement as planned?
Does a class know what needs to be known relevant to current lesson?
What is the performance level for a group of students?
Which areas are above/ below the expected level of perform for a group?
Which areas show a positive / negative trend in perform for a group?
Which areas indicate the overall highest / lowest levels of perform for a group?
Which subgroup(s) show a trend toward increase/ decrease perform?
Between which subgroup(s) is the achievement gap closing / becoming greater?
Predictive
Instructional
Evaluative
Process
Needs assessment
Outcome
Formative
Summative
Formative
Summative
Assessment
Evaluation
Disciplined Inquiry Literature

Making Questions Answerable

Ryan Kelly:
Whoa...That is a lot to digest. To summarize, there are common educational questions that can be answered with data through the implementation of assessment and evaluation methods. Initiatives such as NDMTSS, RTI, and AdvancED provide context for assessment and evaluation in educational settings. Both assessment and evaluation serve two primary purposes: formative, which occurs before and during a process -- such as a program or instructional unit -- to guide the development and implementation of the process; and summative, which occurs at the end of a process to measure the extent to which an intended purpose was achieved.

Teacher Thought

Essentially, no matter what we call data use initiatives, at the core, they are forms of assessment or evaluation, which is made up of summative and formative data. If I identify what I want to know with an operationalized question, then I can determine which type of data to collect to be more effective.

Indicate the extent to which you agree or disagree

	Strongly disagree	Disagree	Agree	Strongly Agree
This module part increased my knowledge of questions that can be answered with data				
This module part increased my knowledge of data use for formative purposes				
This module part increased my knowledge of data use for summative purposes				

Well Done

You have completed this module part. You can begin the next lesson when you are ready.