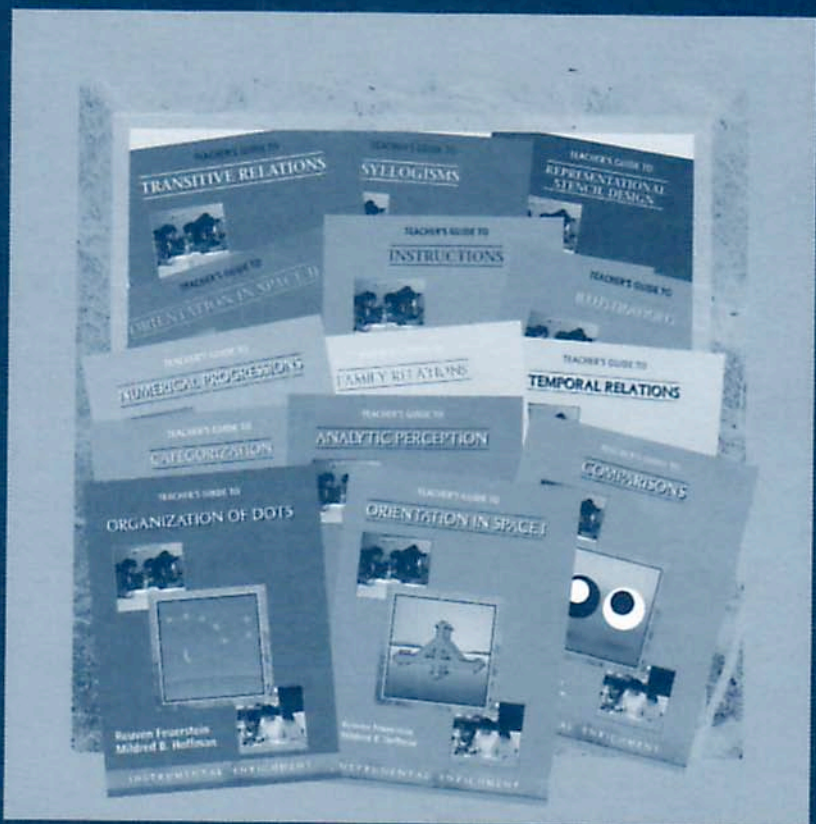

INSTRUMENTAL ENRICHMENT

Your Pathway To Student Achievement



SAMPLE BOOKLET

Contents

Introduction	2
Organization of Dots.....	4
Comparisons	6
Orientation in Space I	8
Analytic Perception	10
Illustrations	12
Family Relations	14
Categorization	16
Numerical Progressions	18
Temporal Relations	20
Instructions	22
Orientation in Space II.....	24
Syllogisms	26
Transitive Relations	28
Representational Stencil Design	30



CognitionIgnition
Where minds get in gear

Feuerstein's Instrumental Enrichment Program

Instrumental Enrichment (IE) is a cognitive education program that was developed in the 1950s by Professor Reuven Feuerstein. The program has been successfully used in seventy countries as a tool for the enhancement of learning potential in specially challenged individuals and those in high-risk environments. IE materials are organized into instruments that comprise paper-and-pencil tasks aimed at such specific cognitive domains as analytic perception, orientation in space and time, comparative behavior, classification, and more. The IE program is mediated by a certified IE trainer and can be implemented in the classroom setting or as an individual tutoring and remedial teaching device. The Instrumental Enrichment program has received worldwide recognition and has been translated into sixteen languages.

Mastery of the tasks in Instrumental Enrichment is never a matter of rote learning or mere reproduction of a learned skill. It always involves the application of rules, principles, or strategies in a variety of tasks. Thus, IE systematically reinforces the cognitive functions that enable learners to define problems, make connections and see relationships, motivate themselves, and improve their work habits.

Instrumental Enrichment consists of fourteen instruments that focus on specific cognitive functions. Learning how to learn takes place through repetition—not repetition of the IE tasks themselves, but of the cognitive functions that enable individuals to think effectively. Tasks become increasingly complex and abstract, and the instruments reinforce cognitive functions in a

cyclical manner. Deliberately free of specific subject matter, the IE tasks are intended to be more readily transferable to all life situations. Through IE, students develop the ability to apply their cognitive functions to any problem or thinking situation.

This booklet includes a sample from each of the fourteen instruments in the Instrumental Enrichment program. Each sample describes an instrument, provides a summary of the cognitive processes the instrument addresses, and presents a task from the instrument. The sample tasks have been chosen randomly from the sequence of tasks in each instrument and do not necessarily reflect the development of the program.

Organization of Dots

Description of the instrument

Organization of Dots provides practice in projecting virtual relationships through tasks that require an individual to identify and outline given figures within a cloud of dots. The projection of a potential relationship requires that the learner search for meaning among otherwise separate phenomena. Through repeated practice and successful completion of progressively more difficult exercises, the instrument encourages task-intrinsic motivation and activates a variety of cognitive functions.

Cognitive functions developed

Definition of the problem.

Selection of dots that are relevant to the figure that is sought.

Planning behavior.

Hypothetical thinking and use of logical evidence.

Spontaneous comparison of projected figure to the model.

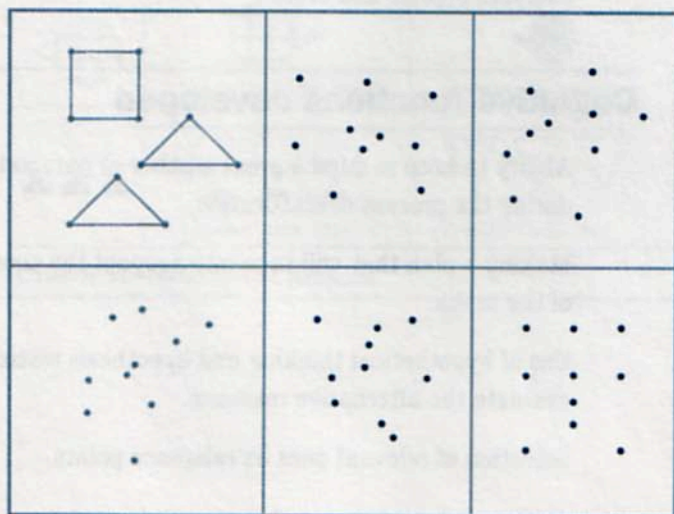
Summative behavior.

Mediation of sample task

Mediation of challenge is indicated in the sample task below, in which there are no given cues and the dots are numerous and close together. Mediation of a feeling of competence is important as the students compare strategies of solution. As in all tasks in Organization of Dots, there must be regulation and control of behavior.

Sample task

Connect the dots so that the geometric figures in the first frame appear in each of the following frames. The orientation of the figures may be different from the first frame, and the figures may overlap.



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Comparisons

Description of the instrument

Comparisons increases an individual's ability to differentiate between parameters of comparison and develops the cognitive functions involved in comparative behavior. The instrument provides concepts, labels, and operations with which to describe similarities and differences. From Comparisons individuals learn to organize and integrate separate and distinct bits of information into coordinated and meaningful systems. The instrument helps build learners' feelings of competence and independence by enriching the repertoire of attributes by which they compare objects and events.

Cognitive functions developed

Ability to keep in mind a great number of parameters during the process of elaboration.

Making a plan that will take into account the complexity of the tasks.

Use of hypothetical thinking and hypothesis testing to evaluate the alternative response.







Selection of relevant cues as reference points.

Mediation of sample tasks

An opportunity for mediated regulation and control of impulsive behavior is provided in the sample tasks below, in which a number of given parameters must be discriminated among. A feeling of competence is mediated to the students as strategies for the solution of the tasks are discussed. Goal-setting and goal-achieving behavior must also be mediated.

Sample tasks

Circle the word or words that describe what is common between the sample picture on the left and each of the pictures in the same row.

Sample picture 	 direction size color form	 direction size color form
	 number color form	 number color form

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Orientation in Space I

Description of the instrument

Orientation in Space I addresses the poor articulation, differentiation, and representation of space that may result from an inability to detach oneself from one's own body position as a reference. It deals with a relative system of reference for localizing objects in space and in relation to one another. As a result of their experience with these tasks, learners discover why there are differing points of view in the perception of an object or experience and how to give consideration to an opinion that is different from their own.

Cognitive functions developed

Definition of problem when no instructions are given or when tasks vary from frame to frame.

Hypothetical thinking: "If . . . then."

Use of logic to solve tasks for which the information is not directly provided.

Comparison as a strategy for checking one's work.

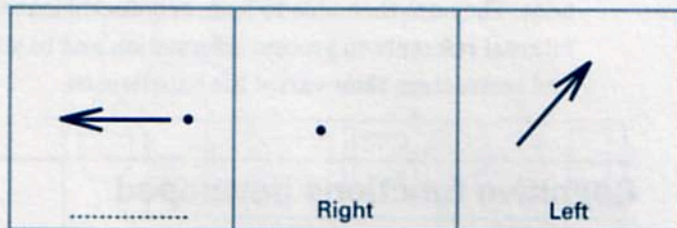
Internalization of the relationship between the elements of the system of reference.

Mediation of sample task

Mediation of goal-seeking, goal-setting, goal-planning, and goal-achieving behavior is indicated in the sample task below, which varies from frame to frame. Mediation of challenge is also indicated.

Sample task

Fill in what is missing so that each frame will contain an arrow, a dot, and an indication to which side of the arrow the dot is on.



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Analytic Perception

Description of the instrument

Analytic Perception enhances one's ability to differentiate (divide a whole into its parts) and integrate (join parts into a whole). Adaptation to the world depends upon the flexibility to alternate between these two perceptual processes. As a result of their experiences with the tasks in this instrument, learners begin to differentiate between inner and outer sources of reference. They are then able to form and discriminately use internal referents to process information and to structure and restructure their varied life experiences.

Cognitive functions developed

Spontaneous comparison to model.

Establishment of relationship between parts, and between the parts and the model.

Categorization of parts according to their shapes and colors.

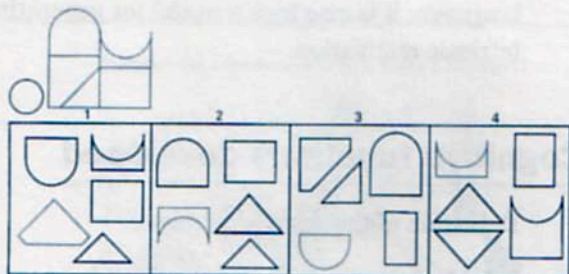
Visual transport of parts to the model.

Mediation of sample task

Mediation for intentionality, reciprocity, transcendence, and meaning are necessary in confronting the sample task below. Sharing behavior is encouraged in comparing strategies and expression.

Sample task

In each of the following exercises you are given a model. Choose the box which contains all the parts that make up that design and write its number in the circle provided.



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Illustrations

Description of the instrument

Illustrations presents a collection of situations in which a problem can be perceived and recognized. Learners attempt to offer an appropriate solution to the identified problem. This instrument mediates learners' ability to perceive details, use several sources of information, and exercise comparative behavior. Illustrations lends itself to the development of vocabulary and oral and written language; it is also highly useful for generating task-intrinsic motivation.

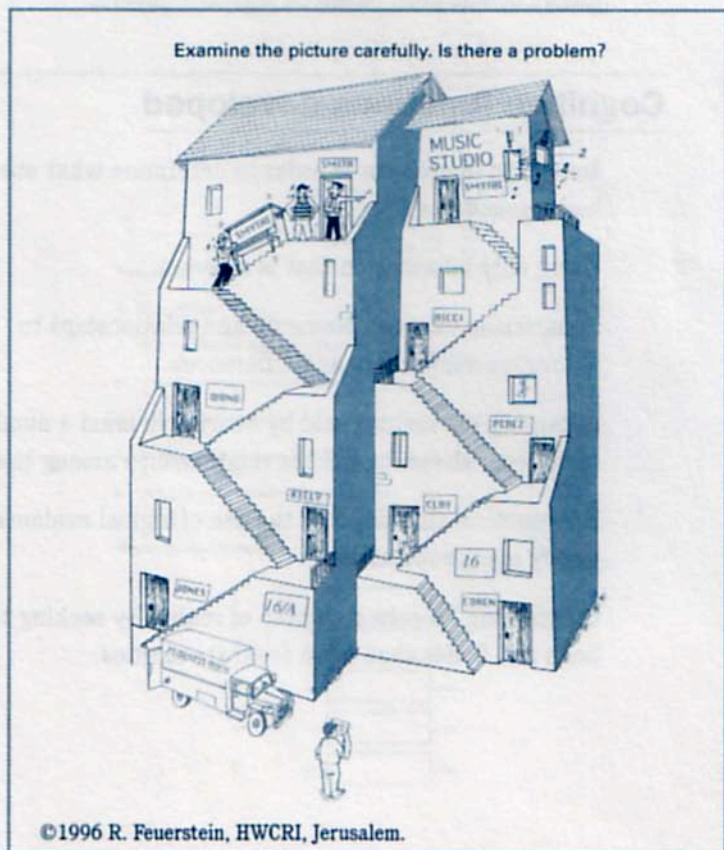
Cognitive functions developed

- Definition of the inferred problem.
- Use of relevant cues as a basis for inference.
- Use of comparative behavior.
- Use of summative behavior.
- Hypothetical thinking and use of logical evidence to support conclusions.
- Establishment of relationships between the individuals, objects, and events shown in the illustrations.

Mediation of sample task

Goal-seeking, goal-setting, goal-planning, and goal-achieving behavior must be mediated in the discussion of the plight of the piano movers in the sample task below. Regulation and control of behavior should be mediated as playing a major role in ensuring time for planning and reflection. The meaning of the pictured event should be mediated and projected into various life situations.

Sample task



Family Relations

Description of the instrument

Family Relations uses a system of relationships to link separate beings and categories and emphasizes the necessary and sufficient conditions for inclusion in and exclusion from categories. The exercises in Family Relations demand precise use of language in encoding and decoding relationships and require inferential thinking, analytic thinking, and deductive reasoning to justify conclusions based on logical evidence.

Cognitive functions developed

Definition of problem in order to determine what one is being asked to do.

Using only information that is relevant.

Comparison between elements and relationships to determine similarities and differences.

Enlarging the mental field by bearing in mind a number of discrete elements and the relationships among them.

Hypothetical thinking and the use of logical evidence to justify one's conclusions.

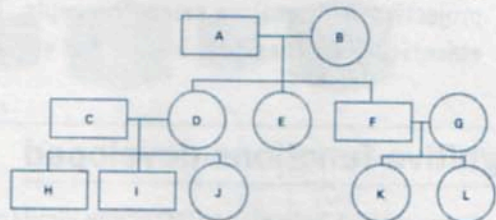
Overcoming an episodic grasp of reality by seeking the links and bonds that unite separate entities.

Mediation of sample tasks

Individuation and psychological differentiation, as well as sharing behavior, should be mediated in the sample tasks below, which require taking a point of view other than one's own. Mediation of goal-planning and goal-achieving behavior is necessary in discussing the process by which the tasks are solved.

Sample tasks

Use the information in the geneological map to complete the page.



Who says:

1. "B is my wife." _____
2. "D is my daughter but I am not her father." _____
3. "E is my sister but I'm not her sister." _____
4. "J is my granddaughter as well as A's granddaughter." _____
5. "H is my cousin. H is also K's cousin." _____
6. "H, I, J, K, and L are my nephews and nieces." _____

What is the relationship?

1. G → → F
2. F → → A
3. A → → H
4. H → → G
5. E → → I

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Categorization

Description of the instrument

Categorization is based on successful comparison, differentiation, and discrimination. This instrument helps individuals develop the flexibility and divergent thinking necessary for categorizing and recategorizing the same objects into different sets as the principles and parameters of categorization change with new needs and objectives. In categorizing, an individual moves from establishing relationships among concrete items to projecting relationships among concepts. This ability is essential to and basic for logical and verbal operations.

Cognitive functions developed

Comparative behavior to ascertain similarities and differences.

Selection of relevant attributes.

Summative behavior.

Projection of relationships.

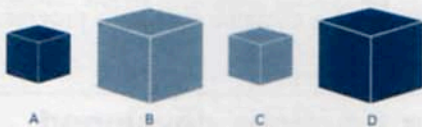
Determination of cognitive categories.

Mediation of sample tasks

Mediation of goal-seeking, goal-planning, and goal-achieving behavior is indicated for the sample tasks below. Mediation of challenge is elicited in the complex task at the bottom. Individuation is mediated in comparing two alternative solutions to the same task.

Sample tasks

Write the correct letter in each empty space.

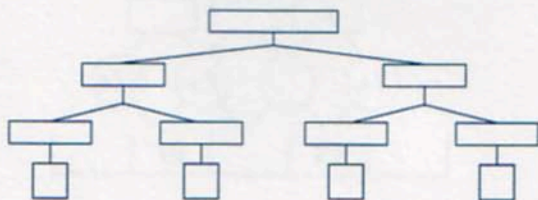


		SIZE	
		SMALL	LARGE
COLOR	GREEN		
	BLACK		

Classify the cubes according to size and color. Fill in the headings and write the correct letter in each empty square.

Subject of classification: _____

Principles of classification: _____ (1) _____
 _____ (2) _____
 _____ (1) _____
 _____ (2) _____



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Numerical Progressions

Description of the instrument

Numerical Progressions helps learners search for, deduce, and induce relationships between separate objects or events. Learners draw accurate conclusions regarding the cause of progressions as the instrument increases their ability to compare, infer, and reason deductively and inductively. This instrument mediates precision, discrimination, and a willingness to defer judgment until all of the elements have been worked out in determining a common rule for a progression.

Cognitive functions developed

Use of relevant tacit cues like index (the place of a number in the progression).

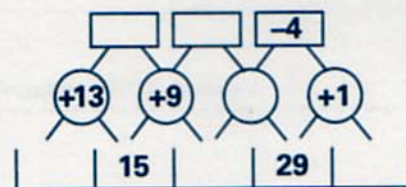
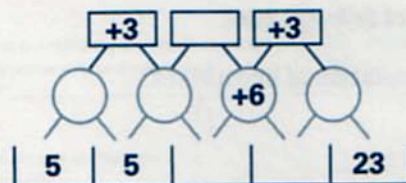
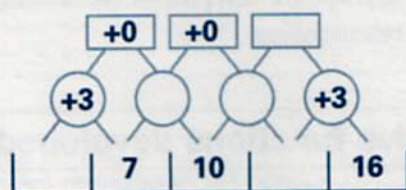
Projection of relationships between the elements of the progression.

Mediation of sample tasks

Mediation of challenge is essential for the very difficult, very complex, and novel sample tasks below. Mediation of intentionality, transcendence, and meaning is indicated in fostering an understanding of higher-order relationships.

Sample tasks

Fill in the progressions, the relationships between the numbers, and the relationship between the relationships.



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Temporal Relations

Description of the instrument

Temporal Relations develops learners' ability to use temporal concepts to describe and order their experiences. An adequate orientation to time is important to relational thinking and is acquired through mediated learning experiences. Without an awareness of the continuity of time and its ordered succession and of the rhythm of events, individuals make no use of their past to predict, anticipate, plan, and prioritize future events. Temporal Relations helps mediate temporal relationships and appropriate and precise use of temporal concepts and relationships.

Cognitive functions developed

Comparison of the temporal characteristics of events.

Use of relevant cues.

Formulation of hypotheses.

Mediation of sample tasks

Mediation of a feeling of competence is necessary in order to define the nature of the sample tasks below and the relevance of the given information to its solution. Projection and control of behavior is mediated in restraining impulsivity in gathering and processing information.

Sample tasks

RIDDLES

Lucy has been in the United States for two years.

Steve has been in the United States for one year.

Is it possible to know which of the two is older? _____

Why? _____

Terry runs 117 yards (107 meters) per minute.

Harry runs 223 yards (214 meters) per minute.

Is it possible to know who will win if they have a race? _____

Why? _____

Maria's mother arrived in Canada fifteen years ago.

Maria's grandmother arrived six years ago.

Who is older? _____

Mark and Lisa are new immigrants.

Mark is 18 years old.

Lisa is 16 years old.

Which one has been in the country for a longer period of time? _____

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Instructions

Description of the instrument

Instructions focuses on encoding and decoding verbal and written information. The difficulty in the tasks is not in the meaning of the words themselves, although learners may occasionally have problems with unfamiliar terms; the difficulty is rather with the significance of the words and with what they imply in context. Through the insights gained into the reasons for their successes and failures, learners are transformed into generators of information, able and willing to interpret and transmit complex instructions.

Cognitive functions developed

Definition of the problem.

Comparison of completed drawing with verbal instructions.

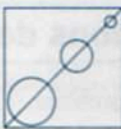

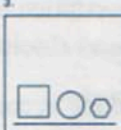
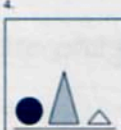
Use of relevant cues to clarify ambiguities.

Hypothetical thinking and use of logical evidence to support hypotheses.

Mediation of sample tasks

Mediated regulation and control of behavior is indicated until the instructions and picture have been completed and errors identified.

Sample tasks

MATCHING/NOT MATCHING			
<p>On the left side of the page there is a description. Beside the description there is a corresponding drawing. Look at the drawing and read the description. Check whether the description matches the drawing. If it does, circle the word MATCHING and go on to the next exercise. If it does not, circle the words NOT MATCHING, and write on the lines the correct description that will match the drawing.</p>			
READ	LOOK	CHECK	WRITE
<p>There are three circles on a diagonal that starts in the right bottom corner. They are arranged according to size order. The smallest circle is at the bottom.</p>	<p>1.</p> 	<p>MATCHING NOT MATCHING</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>There is a yellow diagonal starting from the left bottom corner. On it there are three circles arranged according to size order. The yellow circle is the biggest and it is in the middle.</p>	<p>2.</p> 	<p>MATCHING NOT MATCHING</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>There is a horizontal line and above it there is a hexagon, a circle, and a square arranged according to size order. The hexagon is the smallest and is on the right side. The square is the biggest.</p>	<p>3.</p> 	<p>MATCHING NOT MATCHING</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>There is a horizontal line and above it there are two yellow triangles and a black circle. The large shape is on the left side, and the small shape on the right side.</p>	<p>4.</p> 	<p>MATCHING NOT MATCHING</p>	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

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Orientation in Space II

Description of the instrument

Orientation in Space II introduces and provides practice in the use of external, stable, and absolute systems of reference. Geographical concepts such as compass points, coordinates, and graphs are used to describe relationships and an object's orientation in space. Learners have to simultaneously apply the relative (internal) system of reference and the absolute (external) system of reference to describe and understand spatial relationships.

Cognitive functions developed

Definition of the problem.

Comparison of alternative solutions.

Summing right and left turns and finding their equivalents in fractions of a circle.

Projection and description of spatial relationships in terms of relative and absolute systems of reference.

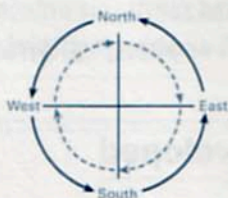
Hypothetical thinking in considering alternative solutions.

Use of logic in the integration of two systems.

Mediation of sample tasks

An opportunity for the mediated regulation and control of behavior is provided in the sample tasks below. The willingness to defer the response until the information has been decoded, gathered, and elaborated and the strategy planned is especially necessary in the last task.

Sample tasks



- | | |
|---------------|----------------------|
| 1 turn = | $\frac{1}{4}$ circle |
| 2 turns = | $\frac{1}{2}$ circle |
| 3 turns = | _____ circle |
| _____ turns = | full circle |

LOOK AT THE ABOVE AND FILL IN THE BLANKS BELOW

- You are facing east.
 - Make _____ turns to the right, so that you return to where you started.
 - Make a _____ circle, so that you return to where you started.
- You are facing north.
 - Make 4 turns to the right and 1 to the left. Where do you face now? _____
 - Make a full circle to the right and $\frac{1}{4}$ circle to the left.
Where do you face now? _____
One turn = _____ circle. _____ turns = $\frac{1}{4}$ circle.
- You are facing north.

Make 3 turns to the right, 2 turns to the left, and a complete circle. Where do you face now? _____

To face east, one can move _____ circle to the right or _____ circle to the left.
- You are to turn from south to east in two steps (there is more than solution):

	Alternative I (turns)	Alternative II (turns)	Alternative III (circles)
FIRST STEP	2 left	2 right	$\frac{1}{4}$ circle right
SECOND STEP	1 right	_____	_____ circle left

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Syllogisms

Description of the instrument

Syllogisms presents formal, propositional logic. In syllogistic reasoning, the integration of information from two premises about the relationship between terms yields the deduction of an unknown relationship. Through the tasks of Syllogisms, learners gain the ability to discriminate between valid and invalid conclusions and between possible and inevitable outcomes. The instrument fosters inferential and abstract thinking.

Cognitive functions developed

Appropriate definition of problem.

Spontaneous comparative behavior between attributes of a set and those of set members.

Selection of relevant data for elaboration.

Overcoming episodic grasp of reality by establishing relationships.

Broadening of mental field to simultaneously elaborate information from several sources.

Elaboration of cognitive categories on the basis of conceptual criteria.

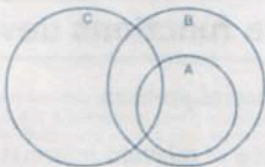
Use of summative behavior.

Hypothetical thinking and search for logical evidence.

Mediation of sample task

Transcendence is reached through insight and generalization from the sample task into other areas of academic, vocational, and life experiences. Meaning is assigned to the logical processes that allow the mind to exceed the confines of the concrete experiences through inferential thinking. Goal-seeking, goal-setting, goal-planning, and goal-achieving behavior is mediated along with the mediation of regulated behavior and a feeling of competence.

Sample task



All the exercises on this Page are based on the above drawing. Look at the drawing above and write the appropriate letters for each set in the parentheses; then fill in the blanks.

1. All predatory animals (A) are dangerous (B).

Some birds (C) are predatory ().

CONCLUSION: Some _____ (C) are _____ (B).



2. All redheads () have freckles ().

Some redheads () have blue eyes ().

CONCLUSION: _____ () _____ ().



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Transitive Relations

Description of the instrument

Transitive Relations deals with relationships that exist in ordered sets, in which the differences between set members are described by the terms "greater than," "less than," and "equal to." This instrument helps learners recognize conditions that permit deductive and inductive reasoning. Through the tasks in Transitive Relations, learners demonstrate their ability to engage in inferential thinking based on logical implication and relational thinking.

Cognitive functions developed

- Definition of problem.
- Selection of relevant information.
- Comparison and categorization.
- Hypothetical thinking.
- Planned and systematic behavior.

Mediation of sample task

Transcendence is reached through insight and generalization from the sample task below into other areas of academic, vocational, and life experiences. Meaning is assigned to the logical processes that allow the mind to exceed the confines of the concrete experiences through inferential thinking. Goal-seeking, goal-setting, goal-planning, and goal-achieving behavior is mediated along with the mediation of regulated behavior and a feeling of competence. A feeling of optimism is mediated as students learn to induce conclusions about unknown relationships.

Sample task

Four construction workers are building a building. Arthur and David together can put up two walls in one work day. Charles and Harold together can also put up two walls in one work day. Arthur does more work in one day than Charles does.

Substitute letters for the names:

Arthur _____ Charles _____

David _____ Harold _____

Using the signs (>, <, =), signify the relationship between:

Arthur David

Charles Harold

Arthur Charles

Charles David

David Harold

Arthur Harold

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Representational Stencil Design

Description of the instrument

Representational Stencil Design consists of tasks in which the student must mentally construct a design. The completion of the tasks requires a complex series of steps. The identification of the whole through its superimposed parts requires an active, mental construction with the help of inferences, and an anticipation and representation of the outcome. Answers are sought by affirmation, negation, and elimination of what is logically impossible. Learners must extrapolate from the known to the unknown and rely on logic to identify the constructions.

Cognitive functions developed

Comparison.

Summative behavior.

Categorization.

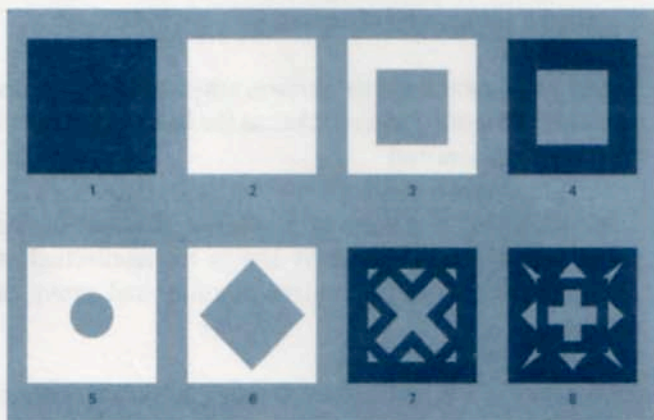
Establishment of temporal and spatial relationships.

Mediation of sample task

Challenge, competence, and optimism are mediated as students realize their ability and teachers expect them to perform this very difficult task. Regulation of impulsive behavior and representational goal-oriented cognitive behavior are key to the mediation offered by the teacher in the context of this instrument.

Sample task

List the stencil numbers that make up the completed design in the right order.



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