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Principles of Applied Behavior Analysis (ABA) in Early Childhood and Elementary School Years

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Summary

- Overview of Applied Behavior Analysis (ABA) and its utility as part of a treatment package with early childhood and elementary school-aged individuals with Autism. Participants will learn about using principles of ABA in teaching, communication, and behavior modification.

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What do you know about ABA?

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What is Applied Behavior Analysis?

Applied Behavior Analysis (ABA) is a science devoted to the understanding and improvement of human behavior.

Applied Behavior Analysts focus on objectively defined behaviors of social significance.

ABA is a scientific approach for discovering environmental variables that reliably influence socially significant behavior and for developing a technology of behavior change that takes practical advantage of those discoveries.

-Uses the scientific method
-Teaching strategies are systematic and involve objective measurement procedures.

Two of the most important principles of ABA are:

1. Behavior that is reinforced is likely to occur again.
2. Behavior that is not reinforced, or is punished, is not likely to occur again.

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ABA (continued)

- **Applied** – out in the world, not in a laboratory, relevant to person or society.
- **Behavior** – everything a person does, appropriate or inappropriate (muscle movement or glandular secretion).
- **Analysis** – data driven, finding relationships between the environment and behavior through systematic manipulations.

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Why ABA?

- Years of research support the use of ABA in increasing outcomes in individuals with an Autism Spectrum Disorder (Axelrod, McElrath, & Wine, 2012).
- Evidence-based practice
- Autism Evidence-Based Practice Review Group (2014)
- National Autism Center (2011)

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Overall Principles of Behavior

- Behavior is learned and can be taught.
- Behavior is predictable.
- Behavior occurrences are affected by environmental factors that interact with physiological characteristics of the person.
- A thorough understanding of the problem behavior is necessary to develop appropriate interventions.
- Assessing and manipulating environmental factors can predictably affect occurrences of behavior.

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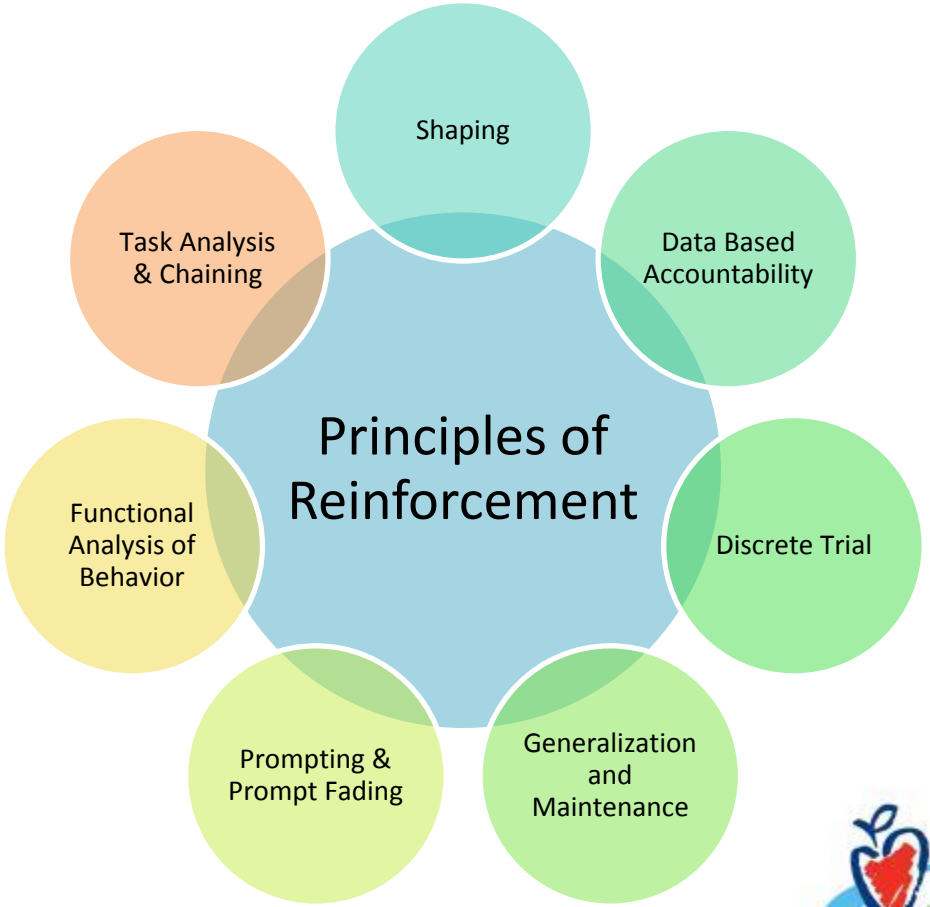
ABA



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How Might ABA Look in Action?

Deficit Area	Possible ABA Strategy
Social interaction	• Reinforcement for interacting with peers • Task Analyzed programs for greetings, conversing with others, playing games, etc. • Discrete Trial Teaching for eye contact and other prosocial skills • Prompting
Communication	• Shaping vocalizations • Reinforcement for appropriate communication • Discrete Trial Teaching
Restricted, repetitive patterns of behavior	• Functional Behavioral Assessment • Antecedent modifications to help with transitions

Important Definitions

- **Behavior** – is the interaction of the muscles and glands of an organism and the environment.
- **Response –** is an instance of a behavior.
- **Topographical Response Class –** is a collection of responses that share a common form.
- **Functional Response Class –** is a collection of responses that share a common relationship as to why they are being done.

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(Continued)

- **Environment –** Constitutes the entire constellation of stimuli that can effect behavior.
- **Stimulus –** a change in the environment that can affect behavior.
- **Consequence –** a stimulus that follows a behavior in time.
- **Antecedent –** a stimulus that proceeds a behavior in time.
- **Establishing Operation –** something that alters the quality of the reinforcement.

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(Continued)

- **Contingency –** a dependent relationship between a response class and one or more stimulus classes.
- **Reinforcement –** increases behavior
- **Punishment –** decreases behavior
- **Contingency-shaped behavior –** behavior acquired via reinforcement contingencies.
- **Rule-governed behavior –** is acquired via descriptions of contingencies without the person actually contacting the contingencies described.

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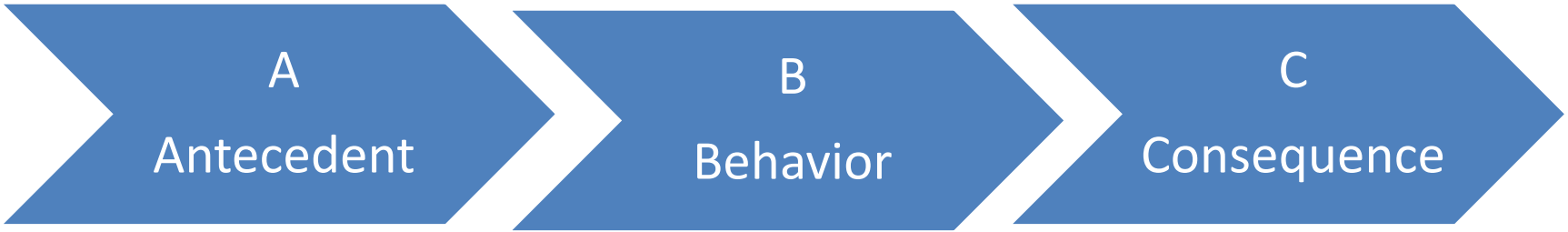
3 Term Contingency



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Where should you start?

Building Rapport!

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Building Relationships – Establishing Rapport

- If you associate yourself repeatedly with a wide variety of activities, people and things that the person values, then eventually your presence will become a signal that many rewarding events and activities are available with you.
- Play with them - Enter their world
- Maximize choice

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Establishing Rapport (Cont.)

- Pair yourself with current reinforcers.
- This is ongoing - not just a stage that occurs once then is dropped.
- Provide situations that the person likes without conditions (noncontingent).
- Building close personal relationships takes time and effort.

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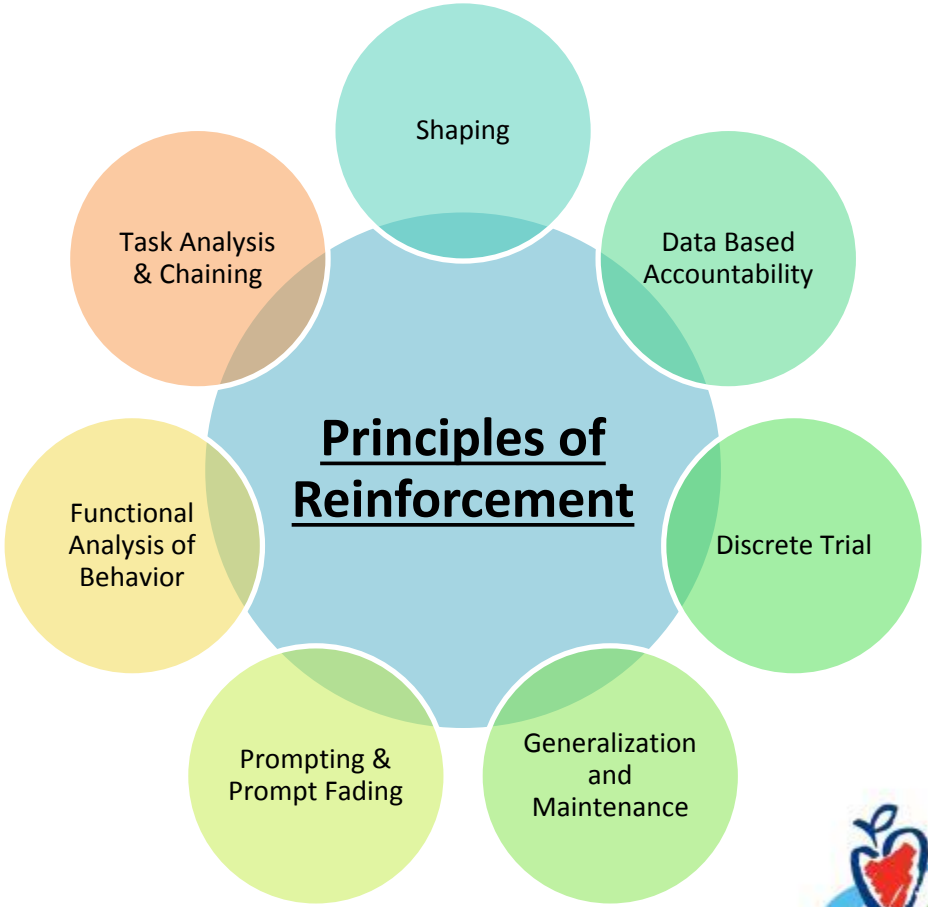
ABA



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Positive Reinforcement

Definition: A positive reinforcer is any stimulus that, when presented contingent upon a target behavior, increases the probability that the behavior will occur again.

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Positive Reinforcement

- Motivation can be an issue for many children.
- In order to achieve Positive Reinforcement, something motivating must be used.
- What motivates one student may not motivate another.
- Deliver as soon as possible based on the child.
- Reinforcer Assessment
- Deprivation/Satiation

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Negative Reinforcement

- Negative Reinforcement is used to increase behavior. It involves the removal of an aversive stimulus contingent upon performance of the desired behavior.

- Some Clarifications:
  - Positive means stimulus added
  - Negative means stimulus removed
  - A Reinforcer increases future behavior
  - A Punisher decreases future behavior

Examples: Alarm Clock – Grocery Tantrum

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Types of Reinforcers

- **Primary:** Those things necessary for the preservation of life (food, drink, warmth, shelter).

- **Secondary:** Conditioned or learned reinforcers. Any stimulus that has acquired reinforcing properties through repeated pairing with primary or previously established conditioned reinforcers.
  - **Social**
  - **Activity**
  - **Token**
  - **Intrinsic**

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How You Deliver a Reinforcer… is as Important as the Reinforcer

Social reinforcers are very effective when they come from persons whom we respect & regard (rapport)

- Establish eye contact
- Pleasant facial expression and tone of voice
- Relaxed body posture
- Acknowledge the child by name
- Choice of words, length of phrase, pitch, & pace compatible with the child's level of comprehension - simple enough to convey the message without talking down to the child.

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Points to Remember about Reinforcement

1. Determine what is reinforcing
2. Reinforce *immediately*
3. Deliver *consistently*
4. Pair primary reinforcers with smiles and social praise (give secondary first)
5. Consider amount (too much, too little)

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Points to Remember (continued)

6. Vary reinforcers
7. Use age appropriate reinforcers (if possible)
8. Consider how much reinforcement is delivered (Magnitude and Intensity)
9. Consider individual differences
10. Remember that more work = more reinforcement

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Effective Praise: Describe the Appropriate Behavior

- Be specific
- Be brief
- “I really liked how you started your math sheet when I asked you to.”
- “You did a great job staying on-task and getting your spelling done.”

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Punishment

Punishment: An environmental change which follows a response which decreases the future frequency of that behavior.

Positive Punishment = aversive stimulus added or magnified following the response.

Negative Punishment = appetitive stimulus taken away following the response.

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Extinction

The process by which a previously reinforced behavior is weakened by withholding reinforcement.

In extinction the behavior which used to receive reinforcement in the form of some change in the environment, now **nothing** happens following the response.

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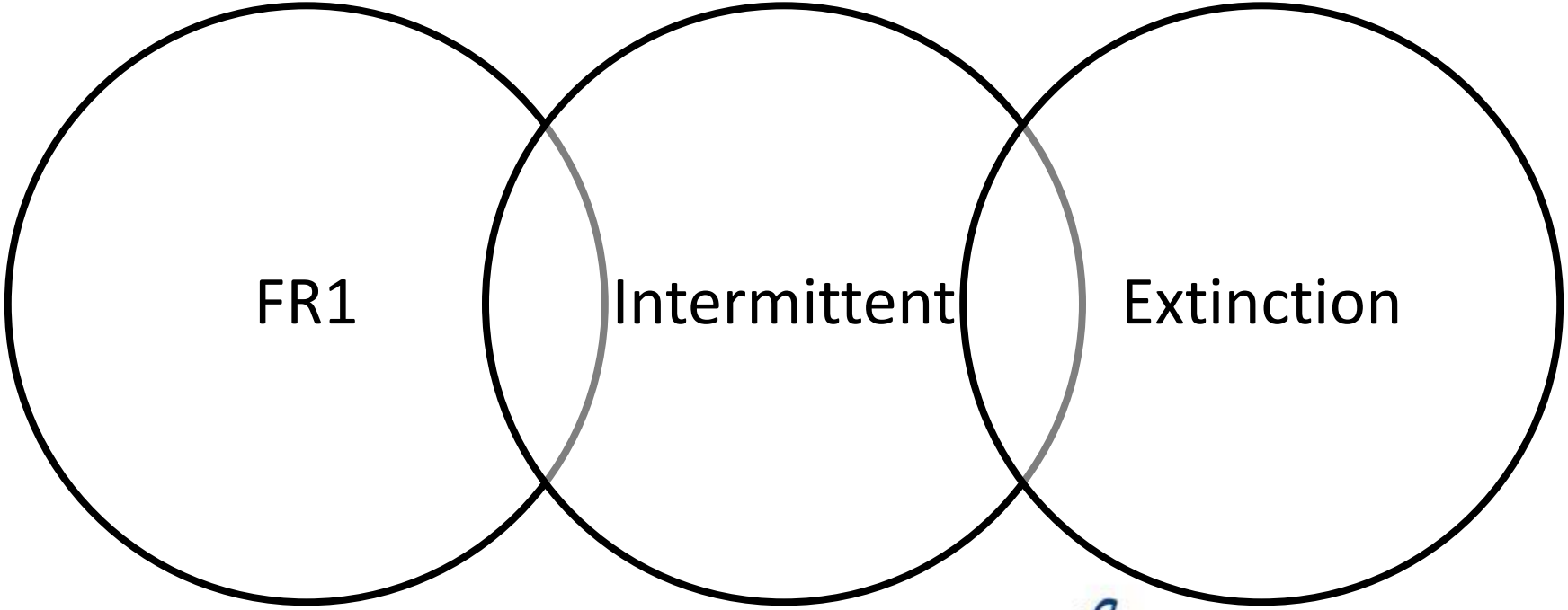
Continuum of Reinforcement



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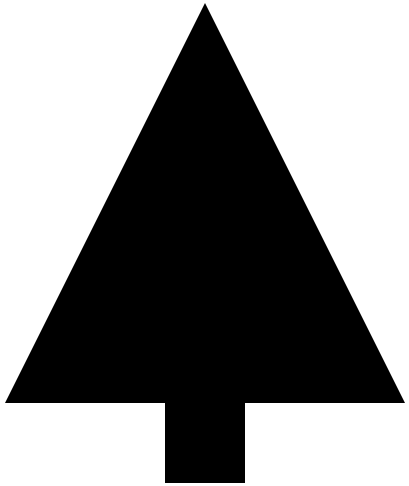
Reinforcement

Increases

Behavior



Positive & Negative

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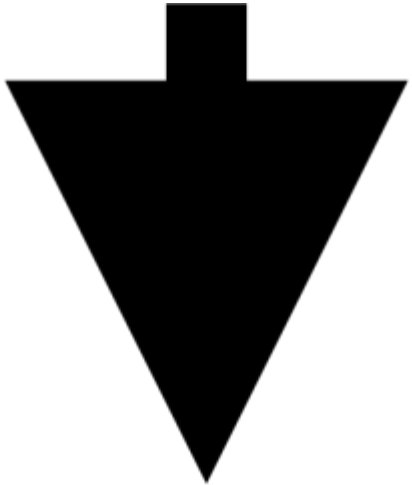
Punishment

Decreases

Behavior

Positive & Negative



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Let's Review…

Reinforcement, both positive and negative

- The contingent addition or removal of a stimulus, the act of which **increases** the frequency of a behavior.

Punishment, both positive and negative

- The contingent addition or removal of a stimulus, the act of which **decreases** the frequency of a behavior.

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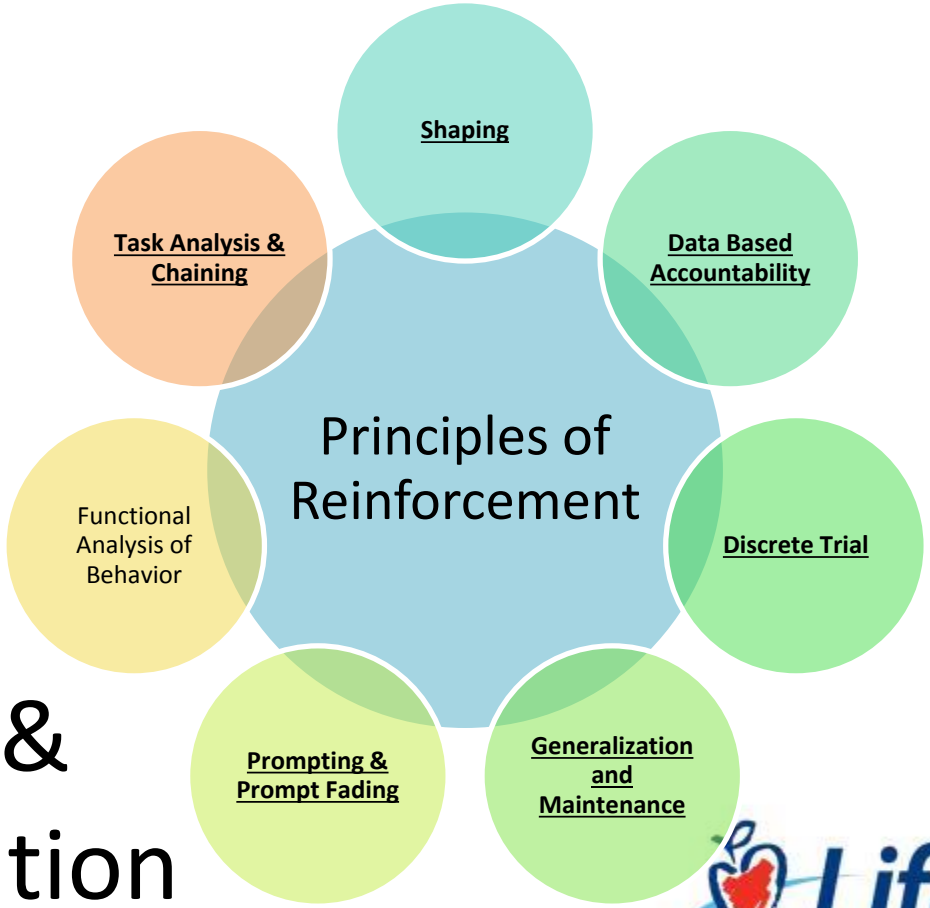
ABA

in Teaching & Communication



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REMEMBER - ABA is not just reducing maladaptive behavior…

ABA is increasing and teaching appropriate behavior too!!

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What is Discrete Trial Teaching (DTT)?

- DTT is a teaching strategy used within ABA that involves systematic training of a specific skill/concept.

- Learning sequences or tasks are broken into very small steps or learning opportunities over a number of trials.

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What is DTT?

- Goal is to structure the antecedents and consequences in a specific manner so that the individual will respond correctly.
- “Discrete” because there is a definite difference between trials.
- Each trial is a separate, distinct unit of learning which tests whether or not the individual understands the concept we are teaching.

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Components

1. Discriminative Stimulus (S^D)
2. Prompt
3. Response
4. Consequence
5. Measurement/Intertrial Interval

New Trial

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Prompts

- Prompt – An extra stimulus inserted into a procedure designed to evoke a desired/correct response

- Prompts help the individual build a connection between the S^D and the desired/correct response.

- Prompts ensure correct responding so that reinforcement can be given.

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Type of Prompt	Description	Example
Full Physical	Student requires physical assistance to complete a task. The teacher will "hand-over-hand" the student to ensure a correct response.	When teaching the student to imitate the movement of waving the teacher takes the child's hand and moves it in a waving motion.
Partial Physical	Student requires partial physical assistance to complete a task.	When teaching the student to imitate the movement of waving the teacher takes the students hand and lets go of it once it is raised.
Full Verbal	Teacher verbally models what the desired response of the student is.	When teaching the expressive label "cup" the teacher asks, "What is it? Say cup."
Partial Verbal Model	Teacher verbally models only part of the desired response of the student.	When teaching the expressive label "cup" the teacher asks, "What is it? Say c....".
Gestural	Teacher makes some kind of gesture to prompt the desired response of the student.	When teaching the function of an object the teacher says, "What do you drink with?" while holding his/her hand to his/her mouth shaping it like a cup.
Proximity/Positional	Teacher places a stimulus in a particular location.	When teaching the receptive label "shoe" the teacher places the shoe closest to the student.
Point	Teacher points	When teaching the receptive label "shoe" the teacher points to the shoe.

Prompts

- Inadvertent Prompts
- Prompt Dependency
- Prompting is the teaching.
- Always make sure prompts are effective (there should never be an incorrect prompted trial.)
- Fade prompts gradually as the student learns the task.

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Errorless Learning

- Not letting the individual get the answer wrong - done through prompting.

- Reinforce both the correct **and** the prompted response.

- If the correct response cannot be prompted, ignore the incorrect response and immediately present a correct, prompted trial.

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Video Example of DTT

- https://www.youtube.com/watch?v=cp_gzUTCm8g

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Task Analysis

- Breaking a multi-step skill down into small teachable steps.
- Task analyzed programs can be used to teach individuals specific skills and creates a more efficient learning environment as it allows individuals to learn increments of behavior to achieve the skills to perform an activity.

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Chaining

Chaining is a procedure in which less complex component behaviors are taught sequentially. The desired response is that the individual will eventually perform all components of a complex task independently.

In a chaining procedure you must:

1. Define the target behavior
2. **Task Analyze** the target behavior
3. Determine if the individual can do the components
4. Baseline
5. Start with the first unknown step

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Chaining Continued

- The desired outcome is:
  - The performance of all of the components
  - In the correct sequence
  - Without prompts

- Examples:
  - Table Setting
  - Dressing
  - Shoe Tying
  - Tooth Brushing
  - Hand Washing
  - Academic Skills

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Learning Readiness Skills

Four skills must be in an individual's repertoire before any other learning can occur:

1. Look
2. Sit
3. Follow simple one-step commands
4. Imitate

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Simple One-Step Commands

TARGET BEHAVIOR:

Within 3 seconds of a command, the individual will perform the action.

PREREQUISITES:

Eye Contact program has been initiated
Sitting Behavior has been initiated

CRITERION:

90% correct responding for each command over 3 consecutive sessions.

MEASUREMENT:

Trial by trial data

PROCEDURE:

1. Give a command (e.g., sit down). Individual will respond appropriately.
2. Use the same procedure for a second command.
3. Randomize the first and second commands.
4. Generalize to a variety of therapists and settings.
5. Use the same procedure for all commands.

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Simple One-Step Commands (continued)

NOTE: To provide opportunities for maintenance and generalization, select commands that the individual is likely to be given within the context of the day.

COMMANDS TO USE:

Give me (object).

Sit Down, Turn Around, Pick it up, Get _____, Come here, Close door, Turn on light, Stand up, Jump, Throw it away.

PROMPTING TECHNIQUES:

1. Full physical prompt: manipulate individual through the command
2. Faded physical prompt: lightly touch or begin to move the individual through the command
3. Gestural prompt: point or signal with your hand
4. Probe: Offer no prompt

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Shaping

Shaping is a procedure in which a new behavior is established by reinforcing successive approximations to a target behavior.

- For a response to be reinforced, it must be at least as good as the previously reinforced response.
- **Shaping** increases the individual's chance of success and increases his/her opportunity to receive reinforcement.
- The skill areas the most frequently require a shaping procedure are: sign language, verbal skills, and handwriting.

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Successive Approximation

- In the process of shaping, each successive approximation is a behavior that more closely resembles the target behavior. The shaping process starts with reinforcement of the first approximation, a behavior currently exhibited by the person. After the first approximation is strengthened through reinforcement, it is extinguished. A closer approximation then occurs and is reinforced. This process continues until the person exhibits the target behavior.

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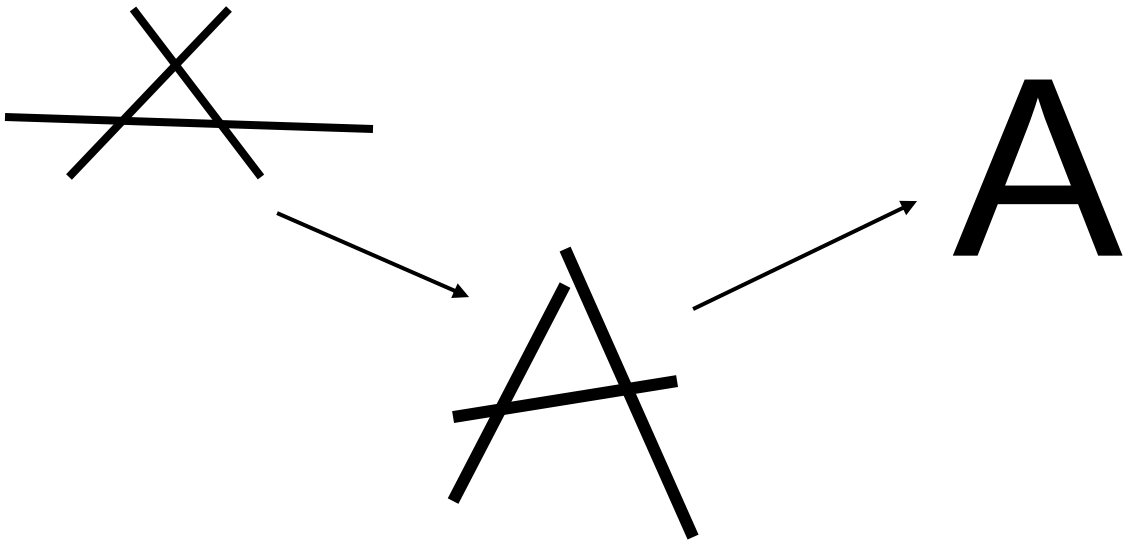
Shaping



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Most Important Points to Remember About Shaping

1. The behavior must be in the ballpark before shaping can be used.

2. Only reinforce behavior that is at least as good as the one before.

3. Communication between **all** professionals working with an individual is essential

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Shaping Procedure

- My **starting behavior** is reinforcing Ariel picking up the pencil.
- My **target behavior** is to have Ariel independently write the letter A.
- The **reinforcer** I will use during my shaping process will be verbal praise.

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Generalization and Maintenance

- **Generalization and Maintenance** are teaching techniques that enable the individual to use newly acquired skills across a variety of situations and with more normalized systems of reinforcement.
- Individuals with autism and related disabilities as well as other developmental disabilities frequently learn in a very concrete, specific manner and do not readily transfer learning to new situations.

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Generalization

Generalization: The occurrence of a target behavior in a non-training situation after training.

Once a skill has been taught to criterion, generalization must be introduced systematically within the natural setting to be effective.

This can be achieved by considering the following:

1. Change to materials or stimuli.
2. Change the teaching environment.
3. Have different staff members teach the skill.
4. Have parents work on the skill in the classroom or center.
5. Have parents work on the skill at home.

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Natural S^D Examples

- Sit down, Stand up, Come here, Put it down, Walk to.
- Saying “hi” in the hallway.
- The sink as the S^D for brushing teeth or washing hands.
- Watch out for prompt dependency!

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Maintenance

- Continuation of the behavior change for a long period after the termination of a behavior modification program.

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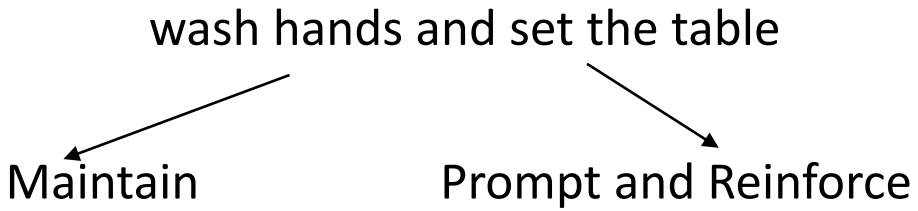
Maintenance begins after the skill has been generalized

To maintain a previously learned skill:

1. Thin the reinforcement schedule until an intermittent schedule is reached.
2. Gradually use secondary over primary reinforcers.
3. Chain a previously learned skill to a new skill:



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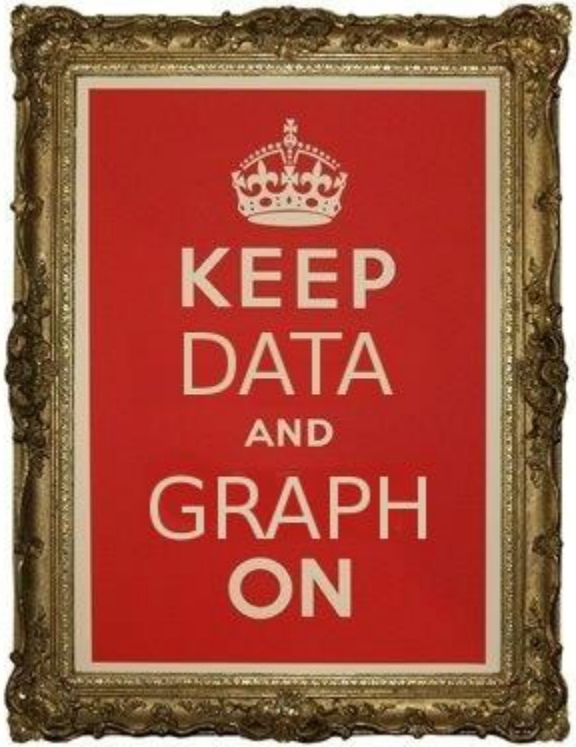
How Do We Measure Effectiveness?



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Before Collecting Data…

- Must know what you're collecting data on.
- Therefore, behavior must be operationally defined (both appropriate behavior and inappropriate behavior).

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Operationally Defined Behavior

- Must be clearly and concisely defined.
- Behavior must be measurable and observable.
- Is clear enough to be reliably understood by multiple individuals.
- Must be something the individual **does**.
- Clearly identifies the onset and offset of the behavior.
- Accounts for the full topography of behavior yet is sufficiently concise to facilitate easy recall.
- Avoids inferences to unknown or untestable variables (e.g. loud, lazy, reluctant, irritable, etc.).

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Key Points - Data Collection

- Data collection is an important component of ABA.
- Accountability is essential.
- Everything one does must be based on objective, measurable information.
- There are several collection techniques that help obtain information.
- Accurately assess the student's progress is essential in data collection.
- Data should be collected on forms.

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Progress

- Data may show making progress and reaching criterion and continue to move along teaching process.

- Data may show student struggling, at which time, modify teaching, reinforcement or discontinue that skill and look at it at a different time.

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Decisions from Data

- Data very important – all decisions based on what data reveals.
- Decisions to move onto the next step or discontinue a program, the types of reinforcers you use - All based on data.
- NEVER want to make subjective decisions when comes to child's programming.

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Types of Data Collection

- Frequency
- Duration
- Time Samples
- Partial Interval Recording
- Trial by Trial
- Prompt

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Frequency

- Number of times the behavior occurs
  - Example: hair pulls, biting self, gain attention
- Lonna pulled staff's hair 3 times
  - Frequency of hair pulls-3
- Lonna tapped staff's shoulder 12 times
  - Frequency of correct responses-12

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Duration

- Length of time the behavior occurred from start to stop.
  - Examples: Refusal, uncooperative behavior, or episode of aggression.
  - I asked Mark to stand up at 9:03 and he did not stand up until 9:07.
    - Duration of refusal = 4 minutes.

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Time Samples

- Used for behavior that occurs at very high rates that counts behavior for a short period of time.
  - Example: Self injury, hand mouthing
- Staff are typically asked to randomly pick the start and stop time.
- Length of the time sample is determined by the behavior analyst/therapist.

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Partial Interval Recording

- Also used for behavior that occurs at very high rates.
- All or none recording method.
  - did the behavior occur during this time period or not (+ yes, - no)
- Length of partial interval recording determined by the behavior analyst/therapist.

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Trial by Trial Data

- Often used with skill acquisition programs.
- Data should be taken immediately.
- May also need to graph this data on a monthly graph.
- Most new behaviors should be trial by trial.

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Prompt Data

- Number and types of prompts used during specific task and time period.
  - Example: toothbrushing, showering, making bed
- Durational measurement used for leisure programs.
  - Example: object manipulation, environmental enrichment, parallel play, interaction play

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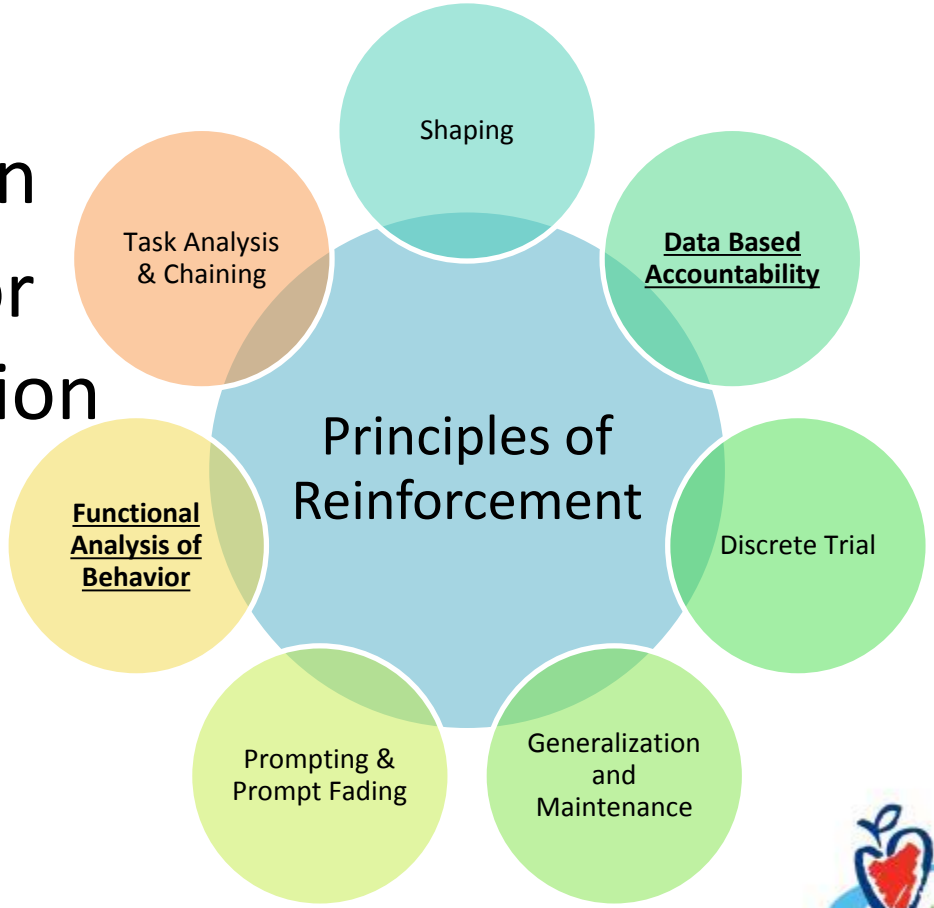
ABA in behavior modification



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Behavior Modification

- Functional Behavior Assessment
- Functional Analysis

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What is Functional Behavior Assessment (FBA)?

A systematic method of assessment for obtaining information about the purposes (functions) a problem behavior serves for a person. Results are used to guide the design of an intervention for decreasing the problem behavior and increasing appropriate alternative behaviors.

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Fundamental Assumptions of FBA

- Behavior has a purpose.
- Challenging behavior is often communicative in nature.
- Challenging behavior is often related to events before and after the behavior.
- Sometimes Challenging behavior serves multiple functions.

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Elements of Functional Assessment

- Identification/definition
  - What is the problem?
  - Operational description of the behavior
- Problem Analysis
  - Why does the problem exist?
  - Identification of the variables that predict the occurrence and nonoccurrence
  - Identification of the consequences that maintain the behaviors (hypotheses)

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Elements of Functional Assessment

(Continued)

- Problem Analysis (Continued)
  - Confirm the antecedents and consequences of behaviors through direct observation
- Plan Development
  - What should be done to address the problem?
- Evaluation of Plan's Effectiveness
  - Did the intervention work?

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Locating the Root of the Problem

FUNCTIONS OF BEHAVIOR

- Social Negative Reinforcement
  (Escape)
- Social Positive Reinforcement
  (Access Attention/Tangible)
- Automatic Positive Reinforcement (Sensory Stimulation)
- Automatic Negative Reinforcement (Medical/Pain Attenuation)

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Following FBA

- You should have strong hypotheses about the function of the problem behavior.
- Develop plan based upon these hypotheses:
  - Contingencies for dealing with maladaptive behaviors.
  - Teaching/Training of appropriate replacement behaviors.

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Behavior Support Plan Development

BSP Desk Reference:

- http://www.pent.ca.gov/dsk/bipmanual.html

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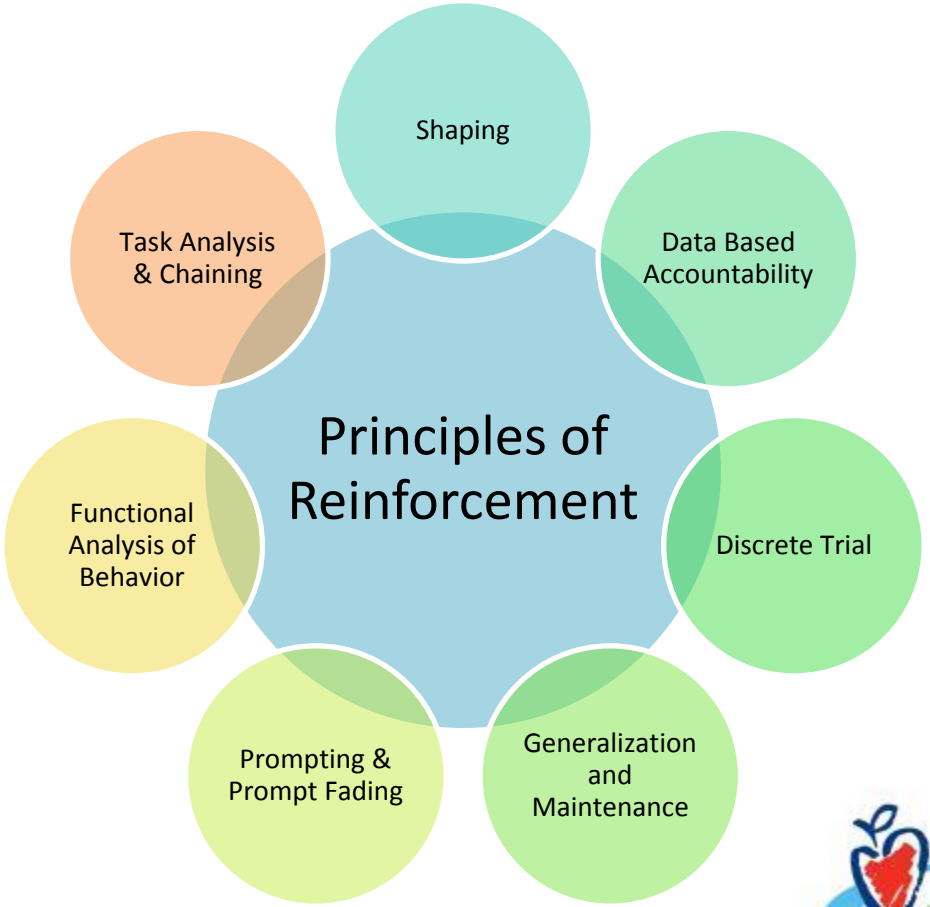
ABA



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How Might ABA Look in Action?

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Communication	• Shaping vocalizations • Reinforcement for appropriate communication • Discrete Trial Teaching • Prompting
Restricted, repetitive patterns of behavior	• Functional Behavioral Assessment • Antecedent modifications to help with transitions

Individualized

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Questions?

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