# Executive Skills: What Are They, Why Do Children Need Them, and How Can We Help Them Get Them?

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# What Are Executive Skills?

- Executive skills refer to the cognitive processes required to plan, organize, and execute activities.
- They are frontal lobe functions that begin to emerge shortly after birth but take more than two full decades to fully mature. In students with attention disorders, they tend to develop more slowly than normal achieving peers.

# Executive Skills: Definitions

- **Response Inhibition:** The capacity to think before you act – this ability to resist the urge to say or do something allows us the time to evaluate a situation and how our behavior might impact it.

- **Working Memory:** The ability to hold information in memory while performing complex tasks. It incorporates the ability to draw on past learning or experience to apply to the situation at hand or to project into the future.

- **Emotional Control:** The ability to manage emotions in order to achieve goals, complete tasks, or control and direct behavior.

# Executive Skills: Definitions

- **Flexibility:** The ability to revise plans in the face of obstacles, setbacks, new information or mistakes. It relates to an adaptability to changing conditions.

- **Sustained Attention:** The capacity to maintain attention to a situation or task in spite of distractibility, fatigue, or boredom.

- **Task Initiation:** The ability to begin projects without undue procrastination, in an efficient or timely fashion.

- **Planning/Prioritization:** The ability to create a roadmap to reach a goal or to complete a task. It also involves being able to make decisions about what's important to focus on and what's not important.

# Executive Skills: Definitions

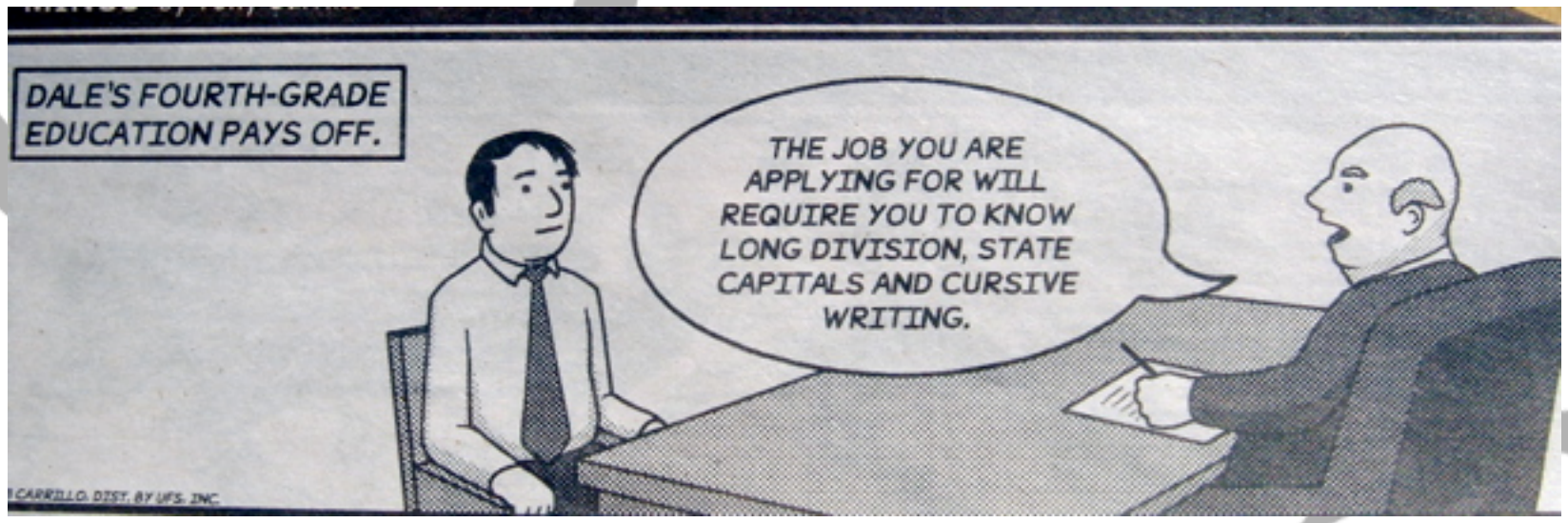
- **Organization:** The ability to create and maintain systems to keep track of information or materials.

- **Time Management:** The capacity to estimate how much time one has, how to allocate it, and how to stay within time limits and deadlines. It also involves a sense that time is important.

- **Goal-directed persistence:** The capacity to have a goal, follow through to the completion of the goal and not be put off or distracted by competing interests.

- **Metacognition:** The ability to stand back and take a birds-eye view of oneself in a situation. It is an ability to observe how you problem solve. It also includes self-monitoring and self-evaluative skills (e.g., asking yourself, "How am I doing? or How did I do?").

# Why is it important to help kids develop executive skills?



# CONTENGENCY-SHAPED/CONTEXT-DEPENDENT SUSTAINED ATTENTION

*A person's sustained response depends on:*

- Novelty
- Intrinsic Reinforcement (Interest) Value
- Extrinsically Provided Consequences

*Therefore, if the task is:*

- Fun
- Interesting
- Immediately Rewarding

*on-task behavior can be sustained (e.g., TV, video games, hands-on activities).*

# Goal Directed Persistence

Requires the individual to—

- Generate and hold a mental representation of the goal in mind (*working memory*).
- Formulate a plan and set of rules to follow (*self-directed speech*).
- Inhibit and regulate negative affect (i.e., disappointment and frustration) associated with self-deprivation).
- Kindle self-motivated or positive drive states in support of the plan (*self-regulation of affect*).
- Experiment with multiple novel approaches toward goal achievement before selecting one to perform (*reconstitution*).

# EXECUTIVE ACTIONS/SKILLS

Allow for:

- Forethought
- Planning
- Goal-Directed Actions
- Self-Discipline
- Will Power
- Persistence

Regardless of interruptions and a lack of immediate reinforcement.

## THE INDIVIDUAL *WITH* ADHD HAS DIMINISHED SELF-REGULATION

…therefore sustained attention is highly context and contingency dependent. Without rewards or interest in the immediate context, work is cut short.

## THE INDIVIDUAL *WITHOUT* ADHD HAS ADEQUATE SELF-REGULATION

therefore s/he requires no source of reward or motivation in the immediate context for performance.

# Biological underpinnings

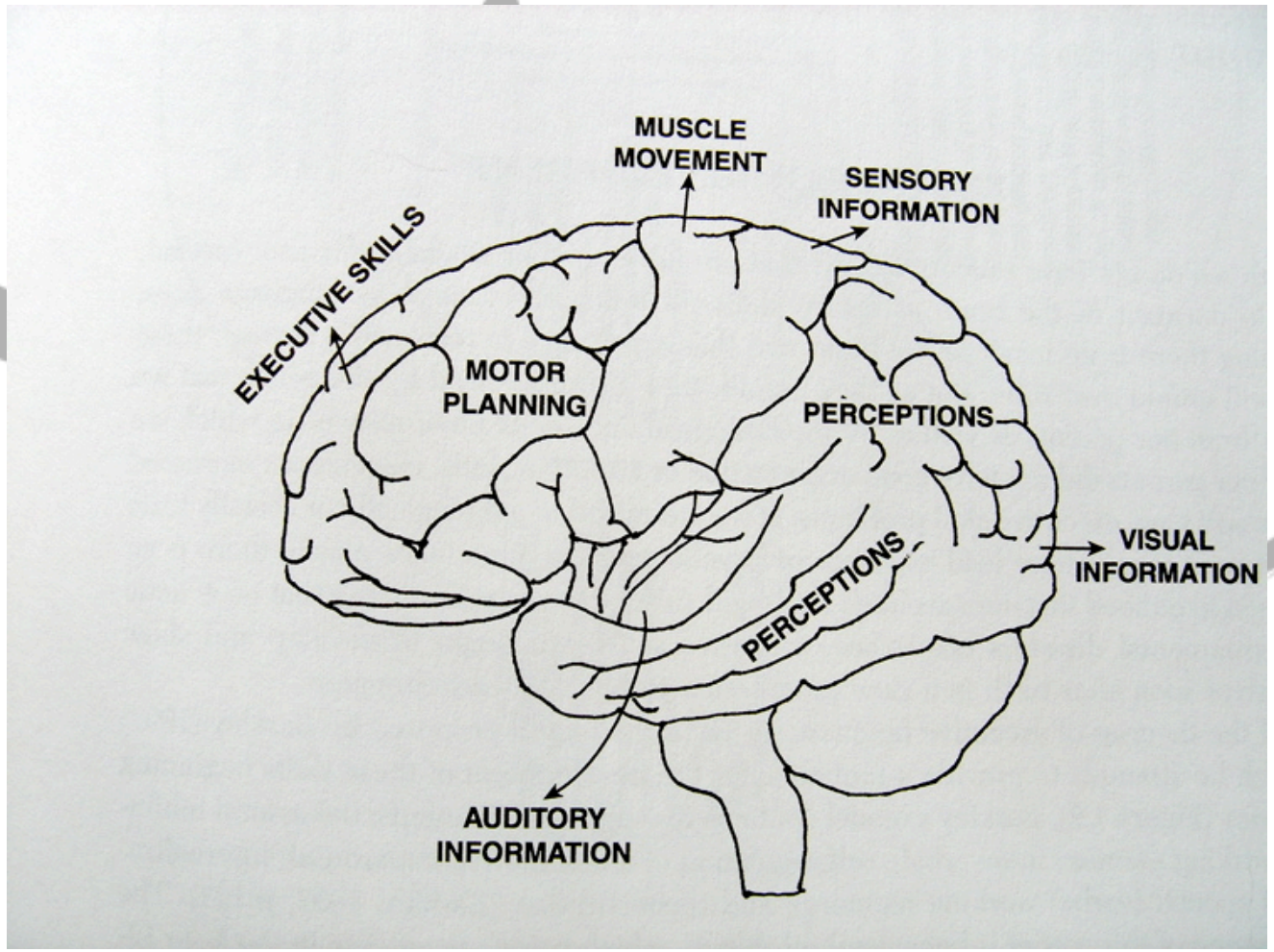
A recent study published by the Journal of the American Medical Association (JAMA) has found differences in dopamine processing in the reward pathways in the brains of subjects with ADHD compared to non-ADHD controls. The study focused on the nucleus accumbens (a brain structure involved with reinforcement and reward) and suggests that people with ADHD may release dopamine at a lower rate compared to normal controls or might have a net dopamine deficit.

# Biological underpinnings

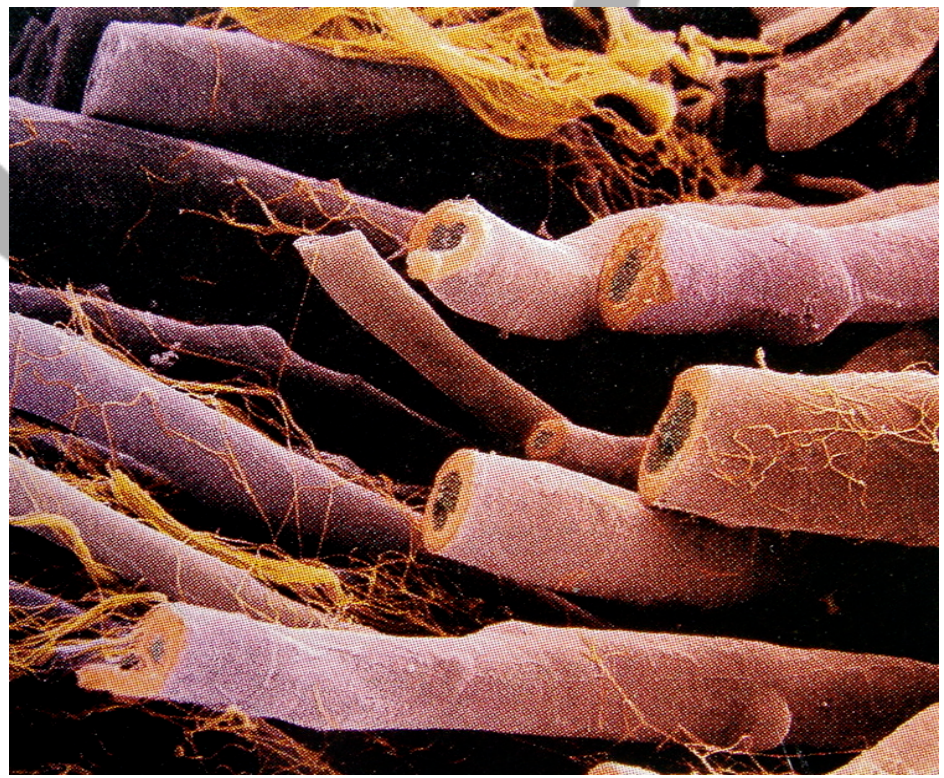
Because dopamine enhances the level of interest a person attaches to a stimulus, people who release dopamine at a lower rate might find it more difficult to work up the enthusiasm to act on stimuli they don't find naturally appealing.

Implication: students with ADHD find it much more difficult to apply themselves to tasks that are not intrinsically interesting to them.

Where in the brain are executive skills "located?" In the frontal brain areas, among others, (just behind the forehead)

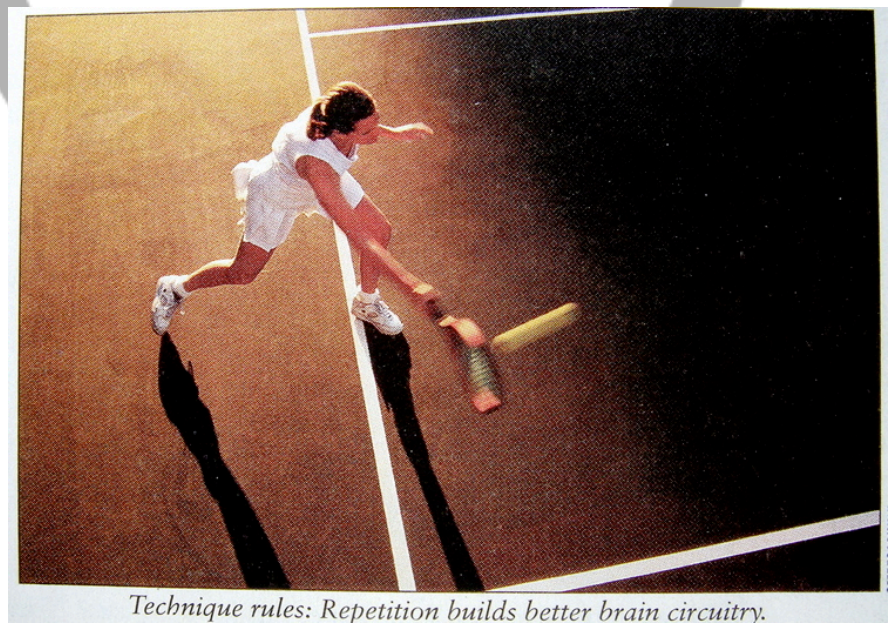


# How do executive skills develop?



Through a process called *myelination*. Myelin acts as insulation, increasing the speed with which nerve impulses are transmitted. The faster the impulse, the better the skill.

# All skills, including executive skills, improve with practice…



*Technique rules: Repetition builds better brain circuitry.*

The more you practice, the better the skill. Practice also makes the task less effortful.

# What Do Executive Skill Weaknesses Look Like in Children?

- Acts without thinking
- Interrupts others
- Overreacts to small problems
- Upset by changes in plans
- Overwhelmed by large assignments
- Talks or plays too loudly
- Resists change of routine
- Acts wild or out of control
- Doesn't notice impact of behavior on others
- Easily overstimulated and has trouble calming down
- Gets stuck on one topic or activity
- Gets overly upset about "little things"
- Out of control more than peers
- Can't come up with more than one way to solve a problem
- Low tolerance for frustration

# What Do Executive Skill Weaknesses Look Like in Children?

- Doesn't write down assignment
- Forgets directions
- Forgets to bring materials home
- Keeps putting off homework
- Runs out of steam before finishing work
- Chooses "fun stuff" over homework
- Passive study methods (or doesn't study)
- Forgets homework/forgets to pass it in
- Leaves long-term assignments until last minute
- Can't break down long-term assignments
- Sloppy work
- Messy notebooks
- Loses books, papers, notebooks
- Can't find things in backpack

Until they are fully developed in children, parents and teachers act as “surrogate” frontal lobes for children.

# There are 3 primary ways adults can help kids with weak executive skills:

1. Change the environment both to reduce the impact of weak executive skills and encourage the use of executive skills.
2. Help the youngster learn and practice executive skills.
3. Use incentives to help youngsters to use skills that are hard for them.

# Move from external to internal: critical dimensions

**EXTERNAL** → **INTERNAL**

**CHANGE ENVIRONMENT** → **CHANGE CHILD**

**EXTERNAL CUE** → **SELF-CUE**

# *Ways to modify the environment*

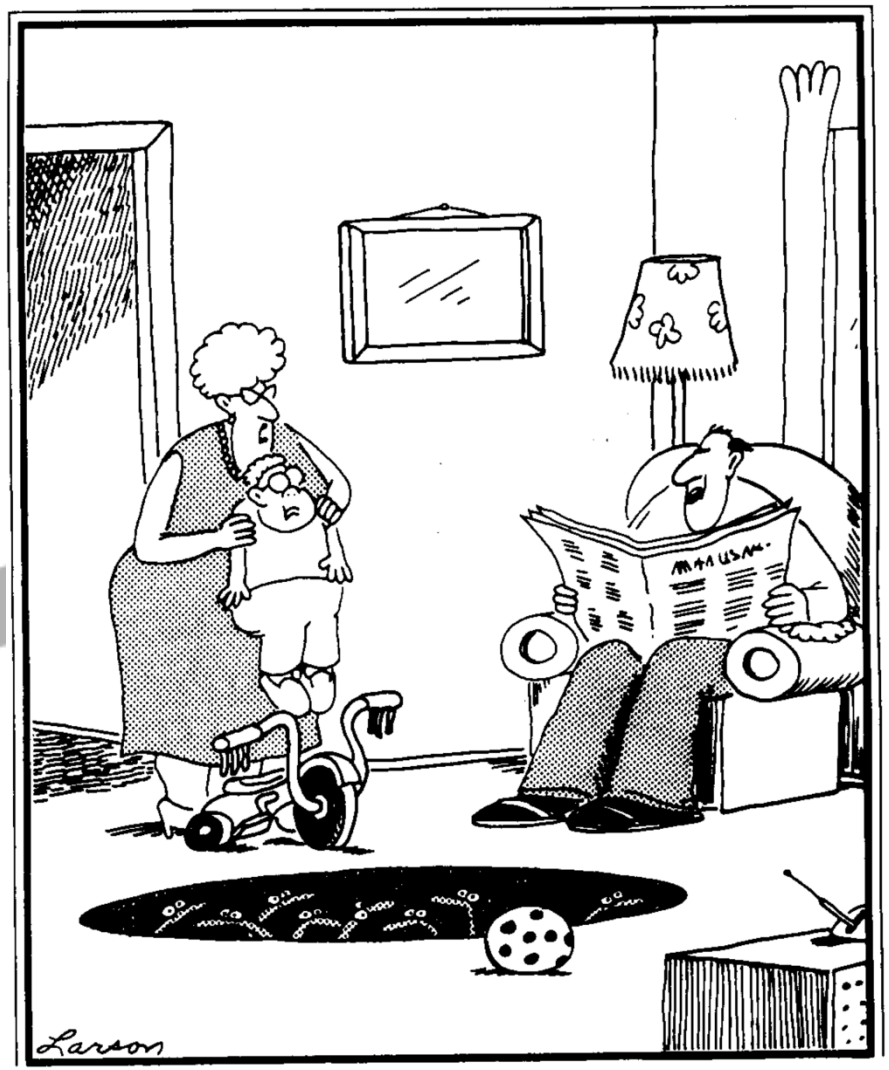
1. Change the physical or social environment
2. Modify the tasks we expect children to perform
3. Provide prompts or cues

# Environmental Modifications for Individual Children

| Task domain/Executive skills | Classroom/Home support |
|---|---|
| Change the physical environment<br>*Response inhibition*<br>*Sustained attention*<br>*Task initiation*<br>*Organization* | • Add barriers (e.g., to avoid runways)<br>• Seating arrangements (e.g., place distractible kids near teacher, away from windows)<br>• Reduce distractions (e.g., music as white noise)<br>• Use organizing structures (e.g., clear plastic containers with labels; bins for homework; consistent space on blackboard for |

# Environmental Modifications for Individual Children

| Task domain/Executive skills | Classroom/Home support |
| --- | --- |
| Change the social environment<br>*Response inhibition*<br>*Emotional control* | • Reduce social complexity (e.g., fewer kids, more adults; supervision on playground; structured play vs. free play)<br>• Change the "social mix" (seating arrangements in class; special table in cafeteria; party; play date) |




"That time was just too close, George! . . . Jimmy was headed straight for the snakepit when I grabbed him!"

# Environmental Modifications for Individual Children

| Task domain/Executive skills | Classroom/Home support |
| --- | --- |
| Modify tasks<br>*Sustained attention*<br>*Task initiation*<br>*Flexibility*<br>*Metacognition* | • Make tasks shorter or build in breaks along the way.<br>• Make steps more explicit. |

# Environmental Modifications for Individual Children

| Task domain/Executive skills | Classroom/Home support |
| --- | --- |
| Modify tasks<br>*Sustained attention*<br>*Task initiation*<br>*Flexibility*<br>*Metacognition* | • Create a schedule, either for a specific event or for a block of time (such as morning work time or the whole day)<br>• Build in variety or choice either for the tasks to be done or the order in which they're to be done.<br>• Make the task closed-ended. |

# Environmental Modifications for Individual Children

| Task domain/Executive skills | Classroom/Home support |
| --- | --- |
| Change the way adults interact with the child<br>*Response inhibition*<br>*Emotional control*<br>*Flexibility*<br>*Working memory* | • Rehearse with the youngster what will happen and how the youngster will handle it.<br>• Use verbal prompts<br>• Remind youngster to use checklist or schedule<br>• Praise youngster for using executive skills—Rule of thumb: 3 POSITIVES for each corrective feedback. |

# TEACH deficient skills

Don’t expect the youngster to acquire executive skills through observation or osmosis.

# 8 steps to teaching executive skills

1. Identify the weak executive skill
2. Identify specific problem behaviors associated with that skill (messy room, not paying attention).
3. Set a goal (child cleans room independently, children pay attention during instruction).
4. Outline the steps that need to be followed in order for the child to achieve the goal.
5. Whenever possible, turn the steps into a list, checklist, or short list of rules to be followed.

# 8 steps to teaching executive skills

6. Supervise the child following the steps.

- Prompt the child to perform each step in the procedure (e.g., *Put dirty clothes in laundry, Put books on bookshelf; Look at teacher while he/she is talking*).
- Observe the child while s/he performs each step, providing feedback to help improve performance (*You missed 2 toys under the bed*).
- Praise the child when s/he successfully completes each step and when the procedure is completed as a whole (*Great job tidying your desk! I like the way you kept your eyes on me while I was explaining how to do the math homework*).

# 8 steps to teaching executive skills

7. Evaluate the program's success and revise if necessary (e.g., change checklist to drop things that aren't needed or to add new items)
8. Fade the supervision. (e.g., cue child to start task, look at their checklist, check in periodically rather than being with the child the entire time)

# Goal: A clean room

**Directive from parent:** *Clean your room*

**Response from child with executive skill deficits (and most other children):** **Nothing**

# Intervention Plan

Step 1: The parent acts as an external frontal lobe that works with the child to perform the following functions:

- Develop *a plan,* an organizational scheme, and a specific set of directions.
- Develop a way to monitor performance.
- Problem solve when something doesn't work.
- Provide encouragement/motivation and feedback about the success of the approach.
- Decide when the task is completed.

# Intervention Plan

*<u>Step 1</u>: Sample statements:*

- *Are we ready to start? OK, let's get started.*
- *Where did you decide your trucks would go? Was it the box?*
- *How about your dirty clothes? In the laundry?*
- *And we decided you could put your books on the bookshelf.*
- *There are two toys under the bed . It doesn't look like all those toys will fit in that one box; Where did the other trucks go? What do you think we can do?*
- *You're almost finished. Is your plan to play with your friends?*
- *This is a hard job but you're almost done! Great work!*
- *You've finished your job for the day.*

# Intervention Plan

Step 2: Provide the same information without being the direct agent: create a list, picture cues, audio tape, etc. to cue the child.

*Parent says to child: Look at your list.*

Step 3: Parent begins to transfer responsibility to child:

*Parent says to child: What do you need to do?*

Step 4: Transfer complete.

*Child now asks himself/herself. What do I need to do?*

# Example 2: Teaching children to make homework plans

Introduce the concept of homework plans:

Explain that making a plan for homework is a good way to learn how to make plans and schedules and to learn time management skills. Explain that before leaving school at the end of the day, the class will make a homework plan.

# Homework Planning Form

| Subject | Do I have all the materials? | Do I need help? | How long will it take? | Start time | Stop time | How long did it take? |
|---|---|---|---|---|---|---|
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# Example: Teaching children to make homework plans

Instruct students to--

1. Write down subjects for which there is homework.
2. Put on top of the desk everything that needs to go home to complete the assignments.
3. Place materials in backpack.
4. Check off on checklist.
5. Check off on list which assignments students will need help with.
6. Estimate how long each assignment will take.
7. Write down start time.
8. Remember to write down stop time and completion time.

# Use incentives to augment instruction.

Incentives make both the effort of learning a skill and the effort of performing a task less aversive.

Furthermore, putting an incentive after a task teaches delayed gratification.

# Putting it all together

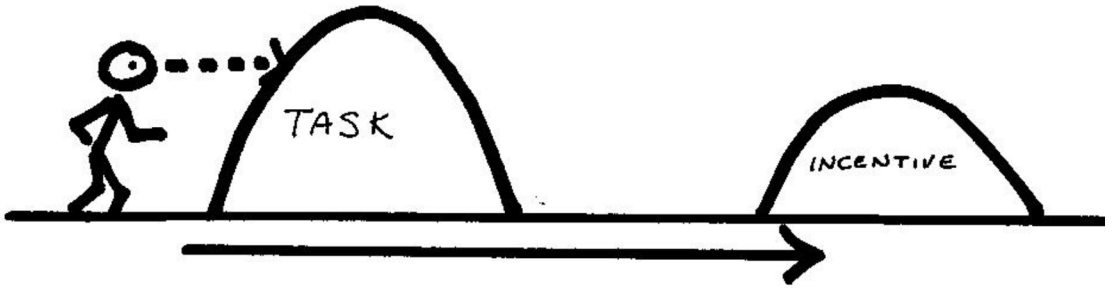
| | |
|---|---|
| Step 1: | Decide on appropriate environmental modifications |
| Step 2: | Plan how to teach the skill |
| Step 3: | Design an incentive system |
| Step 4: | Implement the program |
| Step 5: | Evaluate its effectiveness and make changes as necessary |
| Step 6: | Fade the program |

# *A few additional pointers…*

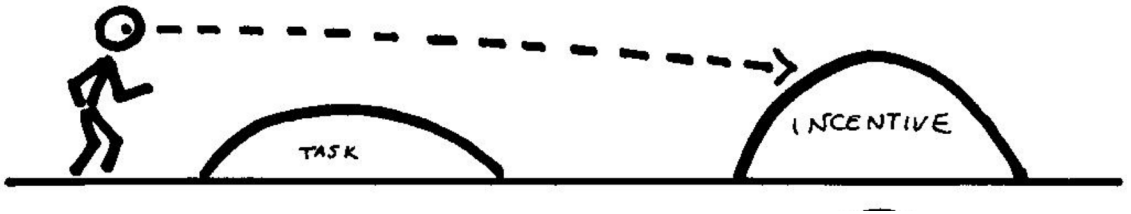
# *Modify task demands to match the youngster's capacity for effortful work*

*Some tasks are more effortful than others--*
*this is as true for adults as it is for children.*

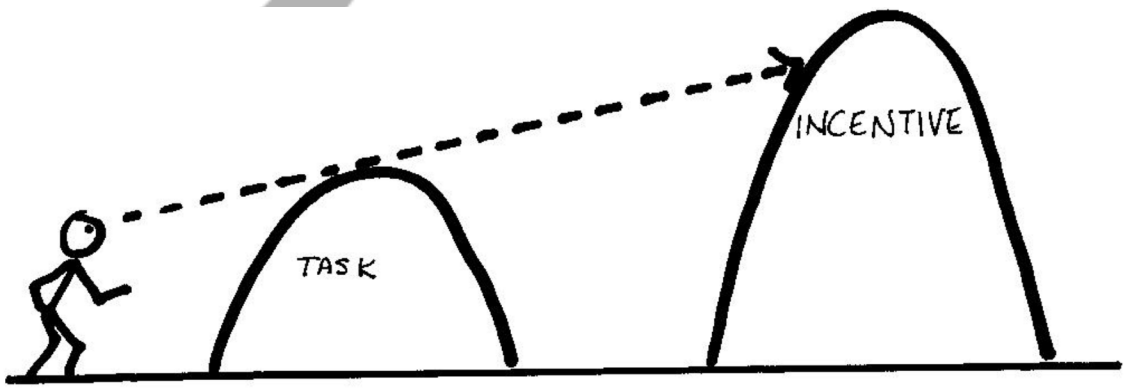
# Modify the relationship between the task and the incentive



# Decrease task demands



# OR increase the incentive



# *Provide the minimum support necessary for the youngster to be successful.*

Two equally weighted components:

- *Minimal support necessary*
- *For the youngster to be successful*

If too much support is provided, the youngster won't become independent. If too little support is provided, the youngster won't be successful.

# *Provide supports and supervision long enough for the youngster to achieve success.*

A general rule of thumb is that it usually takes longer for a youngster to master a task or skill than people think it should.

The desired end point: the youngster can perform the task independently without reminders. If the end point has not been reached, then some support and supervision will be required.