

GAME MANUAL & INTERVENTION GUIDE for Teachers

ATHEMOS

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Introduction

About ATHEMOS

Welcome, and thanks for choosing ATHEMOS for use in your classroom! ATHEMOS is a videogame-supported intervention to help middle school students with ADHD improve their organization, assignment tracking, and note taking skills. Rather than focusing on content areas like other educational games (e.g., math facts), ATHEMOS teaches "academic enablers" that help students record, organize, and schedule academic materials. After players have some success in the game, a real-world mentor then helps the student transfer skills taught in the game to the classroom.

Skills introduced within the game are derived from the *Challenging Horizons Program* (CHP), an evidence-based program that has been delivered in several formats in secondary schools. This computer-assisted format was conceived by Brandon K. Schultz, Ed.D., NCSP, in partnership with the CHP program developer, Steven W. Evans, Ph.D.

Target Population

The interventions included in ATHEMOS were designed for <u>middle school students with</u> <u>attention-deficit/hyperactivity disorder (ADHD) and an interest in video games.</u> But ATHEMOS may be helpful for students who have poor planning and organization skills, regardless of a formal diagnosis. It is not intended for students with intellectual disabilities, severe reading delays, serious physical or psychiatric comorbidities (e.g., schizophrenia), or complicated clinical conditions that might cause the materials to be overly frustrating.

About this Manual

This manual provides an overview of ATHEMOS and outlines strategies to help students transfer skills learned in the game to the classroom. Although the game provides rehearsal of key skills, success requires that teachers assist skill transfer to the classroom. The game makes skill rehearsal fun and easy while removing some of the initial training burdens on teachers. Thus, this manual largely focuses on how to help students apply the skills learned in ATHEMOS to their classwork—a critical phase of the intervention that we refer to as "active transfer."

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Installation and Setup

Overview of Materials

ATHEMOS is an educational videogame paired with real-world interventions to help students experience success in school. As detailed in Section 4 (below), we encourage teachers to:

- Provide the student with frequent access to the game (e.g., 15-minute sessions per day), ideally as a <u>reward</u> for good behavior (e.g., classroom productivity, turning in homework); and
- 2. Begin mentoring sessions no later than two weeks thereafter.

Before you begin, make sure you have compatible computer hardware to run the game:

- Windows 10 PC with discrete graphics card (GPU) and 8GB of RAM or higher
- USB Game Controller (see details below)
- Headphones/earbuds (recommended)

To install the game, follow these steps:

- 1. Download the ATHEMOS game installer from <u>https://www.athemosthegame.org</u>
- 2. Start the install file and follow the onscreen instructions.
- Be sure to put the startup icon/shortcut in a convenient location on your computer (e.g., desktop)

Note. Players will interact with the game using a USB game controller. Many adolescents are familiar with game controllers, but for those who are not, brief tutorials are provided in the game. Some actions in the game can also be done using a keyboard and mouse, but <u>a USB game controller is required</u>.



Quick Note about Graphics:

When starting the game, users have the option to adjust the graphics quality from "very low" to "ultra." Poor game play or *glitchy* graphics can often be corrected by setting the graphics quality to a lower setting. Other options at startup include the screen size and monitor (for multiple monitor setups). For best results, use the maximum possible screen size and do not "window" the game unless necessary.

Creating Student Accounts

To begin, players need a new user account. To start a new account, players select **Play > New Game**. Teachers may want to supervise this initial step to ensure that an appropriate and identifiable player tag is selected.

Once a student account is created, teachers must ensure that players log into the correct account every time. There are no limits to the number of accounts that can be created, so one installation can serve an unlimited number of students. Teachers can track student progress using the account identifiers.





Currently, ATHEMOS does not allow team play—each account is unique to each player.

2. Game Walkthrough



Game Narrative

It is the year 2033 and Earth has narrowly avoided asteroid strikes that may have been launched by extraterrestrials in the asteroid belt beyond Mars. The player must engage the aliens in a new spacecraft called the "ATHEMOS" to collect information (i.e., "intel") about these mysterious beings. Intel are dropped when the player disables the aliens' robot drone spacecraft during space battles. The player must then return to Earth and work with an international team, called the "Silent Canopy" taskforce, to organize and interpret the intel. This cycle repeats, with the player engaging the aliens throughout the solar system and returning to Earth, until all intel are successfully organized and the player learns why the aliens are attacking.



The Silent Canopy Base

On Earth, the player interacts with the Silent Canopy team to understand the intel collected during the space battles. The intel are sentence fragments—noun or adjective phrases—that pertain to one of four aspects of the aliens: (1) their spaceships; (2) their language; (3) their location (i.e., maps); or (4) their secret strategy. Each category is associated with one of four "non-player characters" (NPCs), referred to as the chief science officer, linguist, engineer, and cryptologist, respectively. The four categories are analogous to the four core courses: (a) science; (b) language arts; (c) math; and (d) social studies, respectively. The first task is to decide which category each intel belongs to, and then later the player must identify main ideas and supporting details.

The "**chief science officer**" is found on the first floor of the Silent Canopy base. She helps the player organize intel regarding the aliens' spaceships encountered during the space battles. There are 20 total intel in this category, 4 describing each spaceship.

ATHEMOS landing pad



Floor I

Players can change floors via stairs, an elevator, or by dropping through an open shaft that spans all four floors.

The "**cryptologist**" is found on the second floor. She helps the player organize the aliens' secret strategy intel, describing the aliens' goals and motivations. Clues are provided when the player "talks" to this NPC and explores her space.

This category is perhaps the most challenging of the four because the relevant intel are provided least often. There are 10 total intel pieces in this category, with 5 describing the aliens' motivations and 5 describing the aliens' goals.



Floor 2

Players may need to write notes about what the NPCs tell them so they can have that information later in the game. The "**linguist**" can be found on the fourth floor. He helps players understand the aliens' language. The language intel spans three topics (i.e., main ideas), including resources, locations, and technology. There are 3 to 5 supporting details under each topic.



Floor 4

All dialogue in the game is provided via onscreen text and audio voiceover, so headphones or earbuds might be necessary to avoid distracting others.



The "**engineer**" can also be found on the fourth floor. She helps players organize the maps information, which describes where the aliens are in our solar system. There are four locations in all, with 3 to 4 supporting details for each. <u>Clues scattered around the Silent</u> <u>Canopy base provide a text version of the</u> <u>notes, analogous to a textbook</u>.



The "barracks" can be found on the third floor. Players must go here after working with the NPCs to cycle to the next day and fly another space mission. A menu of options will open when the player approaches the highlighted bunk, allowing them to save the game and advance to the next space mission.

The "CHP"

Players are also assisted by a robot character in the game referred to as the *Computerized Helpmate and Planner*, or CHP (pronounced "Chip"). The CHP teaches and provides feedback on the academic enablers needed to win the game.

The CHP also provides in-game rewards for progress in her "chop shop," found on the first floor. The rewards include new paint jobs for the ATHEMOS (i.e., skins) and periodic upgrades. The player can also use "unlock codes" to access in-game rewards, provided by teachers (Appendix J).





3. Player Progress Tracking

Teacher Portal

On the main game screen (when the game first opens) is a "Teachers" button—in the bottom right corner of the screen—that opens a menu titled "Retrieve Student Analytics." The student analytics provide information about students' logins, total time played, and game progress, which can be used to assess player performance.

In the box below the text "Enter a file path at which to save the analytics file:" type a file path, which is an address to a folder on your computer. By default, the file will save to your documents folder if you press "Save" without entering a path.

ATHEMOS
RETRIEVE STUDENT ANALYTICS Teachers only Please use mouse and keyboard
Enter a file path at which to save the analytics file: CHDocuments
< <u>close</u> >

To the right is an example file path (underlined in red). After you identify a path to save your analytics file, enter it into the input box and press "Save." If successful, you will receive a confirmation message.

If the save was unsuccessful, it is likely for one of two reasons: (1) the path you entered does not exist, or (2) you are attempting to overwrite an analytics file that is already open on your computer. You will receive error messages and what to do to fix it. If the file path does not exist, check that you entered a valid path. If the file was already open, simply close it and try again.





4. Mentoring

Why Mentoring?

By itself, ATHEMOS is unlikely to lead to positive behavior change. To achieve "transfer" to the classroom, follow-on support is needed with frequent but brief (i.e., 10-minute) one-to-one sessions between the student and an educator (i.e., mentor). The advantage of ATHEMOS is that much of the initial skill training and feedback is done within the game. The mentor can then use the player's experiences in the game as an analogy for effective organization, planning, and note-taking strategies. We envision this process unfolding over two phases of implementation:

WEEKS 1 – 2

Phase 1: ATHEMOS as Reward

We encourage mentors to introduce the game as a <u>reward</u> for good behavior, but the criteria for earning play time must be easy to ensure ample practice. For example, mentors might offer 15-minutes of gameplay for the following:

- Following classroom rules;
- Turning in classwork; or
- Bringing required materials to class.

As an added incentive, mentors might ask students to review the game for the developers (i.e., being a 'game designer').

WEEKS 3+

Phase 2: ATHEMOS as Analogy

After players experience the game, mentors meet with students regularly to discuss how the game imitates real-world demands. The mentor might ask:

- "Remember how you organized the 'intel' into four color-coded categories? Perhaps we can do that with your binder."
- "Can I show you how you might use the planner from the game to plan your assignments at school?"

At that point, the student's real-world progress is monitored using the procedures described below (see sections 4.1. to 4.3.).

Before you Begin

- **Read all materials carefully!** Mentors must familiarize themselves with each intervention, the relevant tracking sheets, and supporting materials in the appendices.
- **Gather baseline data**. To accurately assess the intervention, it is crucial to know the student's pre-intervention performance level, especially in core courses. Each intervention described below provides strategies for baseline data collection.

Initial Meeting

- 1. **Introduce ATHEMOS**. The intervention begins when the mentor meets individually with the student in a private setting to introduce the game. As described above, we encourage mentors to offer the game initially as a <u>reward</u> for good behavior. To do so effectively, mentors must identify and define a desired behavior (or two) to reward and outline their expectations for the student.
- 2. **Explain the goal of the game**. Many components of ATHEMOS are unique and require a brief introduction. Mentors might say:

"ATHEMOS is about space invaders, but to win, you must gather and sort clues to understand why the aliens are attacking. So, it's really a <u>mystery</u> game, and it can be challenging! Look for clues everywhere and be sure to talk to all the characters. You can keep an ATHEMOS journal to remember important details." (Appendix F)

- 3. Set up a student account. In the initial meeting, the mentor must set up an account for the student using an acceptable username. A user-specific account is necessary to track progress with the game and to identify areas where players struggle.
- 4. Allow initial play time. To get the student started, mentors should allow 10- to 15minutes of gameplay during the first session (noncontingently) and answer any questions the student might have about the game or how to interact with it.

If the student is not engaged by ATHEMOS, mentors might consider an alternative reward for the target behavior and subsequent gameplay (e.g., additional computer time for other apps/games). The interventions described herein might still be used, but without the potential advantage of having foundational concepts introduced by the game.

On the following pages are descriptions of three interventions that can be implemented after introducing students to ATHEMOS. We encourage mentors to select interventions based on individual student needs, in consultation with a behavior specialist (e.g., school psychologist). But in general, ATHEMOS interventions are meant to address the following concerns that are common for students with ADHD:

Concerns:	Suggested Intervention(s):
"Lost" work, missing homework, or failure to	
bring needed materials to class	Organization (pp. 15 - 18)
Late work, poor performance on long-term	
assignments, or unpreparedness for	
upcoming events/needs	Assignment Tracking (pp. 19 - 22)
Off-task, daydreaming, disruptive behavior,	
lack of class participation, or low test/quiz	
scores	Note Taking (pp. 23 - 27)

4.1. Organization

Intervention Objectives

Students will adopt and maintain a consistent organization system for school-related materials.

Intervention Outcomes

At the end of this intervention, students will be able to:

 Quickly and independently locate school-related materials.

Materials You Will Need

- ATHEMOS game/computer/controller
- 3-ring binder (preferably with zipper)
- Two-pocket folders with holes for a 3-ring binder as follows:
 - Homework folder (Yellow)
 - Science folder (Red)
 - Language Arts folder (Green)
 - Math folder (Blue)
 - Social Studies folder (Purple)
 - Organization Tracking Sheet (OTS)
- Optional: Standard white matte sticker paper (whole sheet, 8.5" x 11")

Baseline Data Collection

To assess the student's pre-intervention performance level, we recommend the following:

- Classroom Performance Survey (CPS). The CPS is a brief, no-cost teacher rating scale. Prioritize reports from core course teachers (Language Arts, Math, Science, and Social Studies) because those classes typically place most demand on organization.
- Review the student's game performance log from ATHEMOS (see Section 3).

Introduce the Real-World Intervention

After the student has played ATHEMOS for two weeks (or 60+ total minutes), meet one-to-one to accomplish the following:

1. **Explain the ATHEMOS analogy**. Remind the student of their success in the game with a multiple-category organization system. ATHEMOS players are required to sort information into color-coded categories that mimic the four core courses: Science (Red), Language Arts (Green), Math (Blue), and Social Studies (Purple).



Players are exposed to these categories and this color coding system throughout the game. Ideally, mentors will use this same color scheme in the real-world binder, reinforced with ATHEMOS-themed stickers to aide transfer (Appendix I). For example, it might help to say:

"In the game, you have to sort the intel into four color-coded categories. Those categories are just like your classes at school, and the organization system in the game is just like a binder or locker at school. Figuring out that system in the game is necessary for you to win, just like a good binder/locker is necessary for success at school."

2. **Review existing organization**. Examine the student's binders, notebooks, tablets, or other areas used to store class materials. Use baseline teacher ratings to evaluate what may or may not work well. Compare this real-world system to the organization system used within ATHEMOS and note similarities and dissimilarities. For example:

"You currently don't have a separate folder for each class. I would imagine that makes organization difficult. In the game, for example, it would be nearly impossible to figure out what the intel meant if there weren't four separate categories."

3. **Introduce the organization tracking sheet (OTS)**. Explain the OTS (see Appendix A and B) and help the student select 8 to 12 criteria that are appropriate. If needed, create new criteria specific to the student's needs. Note any materials the student might need to meet the criteria (e.g., new notebooks). The mentor might say:

"Let's create an organization checklist by picking items that make sense for you. What are some items you think might be helpful?"

4. **Score the student's organization**. Once criteria are selected, write them in the row heading on the student's OTS and check to see if the student's materials meet each criterion or not. Put the date at the top of the first column and record 'yes' or 'no' in corresponding field. The 'yes' or 'no' should indicate if the materials met the criterion before any corrective action. The mentor might say:

"Let's check your binder using the checklist. The first item asks, 'Is your assignment notebook secured by three rings so that it is the first thing you see when you open your binder?' Is that the case? Let's see..."

For all items that result in 'no,' help the student correct the problem to align with the checklist expectations. If new materials are needed (e.g., notebooks), provide that to the student after the total checklist score is recorded.

5. **Schedule regular meetings**. Schedule regular meetings to review the OTS with the student at least one time per week.

Subsequent Meetings

- 1. Review the checklist. At the beginning of each meeting, remind the student of the OTS and ask to see the student's organization system. If the student does not have their organization system with them, he/she must get them before proceeding.
- 2. Score the checklist. Together, the mentor and student assess whether each criterion on the checklist is met (i.e., binder, notebook, bookbag, tablet). Again, record each item as either 'Y' for met or 'N' for unmet. All aspects of each criterion must be met to earn a 'Y'—there is no partial credit.

3. Record a total score. Add the number of met criteria, divide by the total number of items, and multiply by 100 to calculate a percentage. Enter this percentage in the cell at the bottom of the column. Provide the student with this feedback and invite him/her to reflect on their score:

"You met 8 of the 10 items on the binder checklist, resulting in a score of 80%. What does this say about your organization since our last meeting?"

- **4. Correct unmet criteria**. After scoring the entire checklist, have the student correct each unmet item on the OTS. It is important that the student (not the mentor) make all corrections.
- 5. **Provide feedback.** Discuss ways the student might correct any missed criteria prior to the next session and praise <u>effort</u> using specific, descriptive language. For example:

"Your effort to fix the torn notebook shows real initiative."

"Going from 22% organized to 78% organized says a lot about you and your ability to adjust to feedback."

"What are some things you could do between now and the next time we meet to make sure the assignment notebook stays in your binder?"

It is also helpful to graph the organization scores over time for the student. Tools for graphing single-case data are available online.

Timeline

This intervention is expected to take 2-3 months of consistent implementation (i.e., meeting 1-3 times per week), but student response varies. We have found four general response patterns:

- Immediate Responder	Achieves high organization scores early (within first four sessions) and maintains success over time.
 Slow-But-Steady Responder 	Ultimately achieves high performance but needs more than a month to get there. Progress seems like 'three steps forward and two steps back.'
- Honeymoon Responder	Early success, but then backslides. Typically, these students fall into a slow-but-steady pattern.
– Non-Responder	Do not make meaningful gains. This pattern is rare, so mentors must attempt the intervention for several weeks and try multiple reward systems before concluding that the student is non-responsive.

Ending the Intervention

- **Mastery**. If the student is achieving 90% or greater for 4 or more consecutive sessions, the mentor may consider fading the organization intervention.
- **Fading**. Fading begins by reducing the number of sessions (e.g., one every other week) and assuring that the student continues to achieve greater than 90%.
- **Relapse**. If at any point it appears that the student relapses to 'old habits' of disorganization, return to regular weekly meetings.
- **Spot checks/booster sessions**. Conduct a surprise check after the intervention ends just to confirm that the student does not relapse.

Assessing Impact

At the end of the intervention, ask the teachers who provided baseline data to complete the same rating scale again and compare the pre- and post-intervention scores. A behavioral consultant (e.g., school psychologist) can assist when interpreting change. Change metrics (e.g., effect sizes) quantify the degree to which the intervention was helpful and can guide decision making within multitiered systems of support.

Troubleshooting. Common problems and their solutions are as follows:

- Student seems unmotivated. Start with *praise* as the primary reward for organization success, but if the student fails to make progress after four organization checks, add privilege or tangible rewards for specific target thresholds on the OTS (e.g., 10% improvement over the previous average). If the student is motivated to play the game, provide "unlock codes" for real-world progress (Appendix J). Also consider sharing the OTS with the student's parents and encourage them to provide behavioral contingencies at home.
- **Student makes excuses.** It is important to strictly adhere to the details of the checklist items even if the student says they were confused, were absent, or offers other reasons for nonadherence. The only exception is when classroom expectations change.
- **Organization expectations change**. If organization expectations change (e.g., a new folder system is introduced in one class), the mentor and student must rewrite the relevant items on the OTS. Scores over time will remain comparable because each measurement occasion produces a proportion of all items met.
- The intervention is time-consuming. During the first two to three sessions, organization checks typically take 15 minutes. But over time, the mentor can move from reading each item aloud to having the student self-administer the checklist. At that point, the mentor simply supervises as the student scores his/her own adherence.

4.2. Assignment Tracking

Intervention Objectives

Students will be able to write all assignments accurately and legibly in the appropriate place in her/her assignment notebook or on an online tracking system; thus, increasing the amount of work and homework assignments submitted on time.

Intervention Outcomes

At the end of this intervention, students will be able to:

 Track assignments independently without prompting from teachers or mentors.

Materials You Will Need

- ATHEMOS game/computer/controller
- Assignment notebook or online tracking system used in classes (e.g., online calendar)
- Assignment Tracking Sheet (ATS)
- Writing utensils

Baseline Data Collection

To assess the student's pre-intervention performance level, we recommend the following:

- Speak with teachers to obtain information about the expectation for submitting homework assignments. Based on teachers' report, calculate the percentage of homework the student submitting on time prior to intervention.
 - For example, based on teachers' report, if the student had ten assignments across all classes and they turned in three, their proportion of assignments turned in would be 3/10 (30%).
- Review the student's game performance log from ATHEMOS (see Section 3).

Before Starting the Intervention

Before starting the intervention, the mentor must determine the following:

• The mentor will need to independently validate the information that the student writes in their planner. This independent validation can occur by checking teachers' classroom websites (if applicable), having teachers initial the assignment notebook, or face-to-face checking. Mentors must work with teachers to determine the easiest and most accurate way to ensure the student correctly recorded the assignment.

Introduce the Real-World Intervention

After the student has played ATHEMOS for two weeks (or 60+ total minutes), meet one-to-one to accomplish the following:

1. Explain the ATHEMOS analogy. Remind the student that to figure out what the intel means, they need to schedule meetings in their planner with the Silent Canopy World Defense Team. ATHEMOS players are required to keep track of important meetings, much like they need to keep track of when assignments are due, or they may forget to complete them. The game allows players to plan and practice scheduling meetings.

For example, it might help to say:

"In the game, you scheduled meetings with the Silent Canopy team using a planner. The planner in the game helps you remember important things you must do to win. You probably checked it often. It's the same at school. Using a planner can help you remember assignments you need to turn in."

2. Review existing assignment tracking. Remind the student that writing their assignments in one place can help them remember to do their homework and turn it in. The mentor might say:

"How do you currently track your assignments?"

"How is that working for you?"

"It sounds like it can be difficult to check with your teachers or to use online systems to see what is due in all your classes."

3. Introduce and model the assignment tracker/planner sheet. Using the tool most available (or try Appendix C), explain the method of assignment tracking. The student should record his/her class assignments after each class period. If no assignment was given, the student should record "none" in the appropriate spot to ensure that the entry was not forgotten. The mentor might say:

"Lots of students have found that recording their assignments in one place makes it easier to remember what needs to be turned in each day. For example, students sometimes use a tracking system like this (pointing to Appendix C or something comparable) to record what is due in each class, using enough detail to remind them what is needed. If nothing is due, they write the word 'none.' Can I show you what this would look like with your assignments?"

4. Schedule regular meetings. Encourage the student to try the assignment tracking system and schedule regular meetings to review the student's progress at least two times per week.

Subsequent Meetings

1. Review the tracking sheet. At the beginning of each meeting, remind the student of the tracking system and ask to see the student's Assignment Notebook/Planner (or online equivalent). If the student does not have their Assignment Notebook with them, he/she must get it before proceeding. The mentor might ask:

"Show me your planner for this week." (Looking at attempts in the student's planner)

"How well have you been able to track your assignments?"

- 2. Score the tracking sheet. Together, the mentor and student assess whether each assignment has been accurately recorded. Mentors can choose the validation system that works best for them (e.g., websites, homework hotlines, teacher initials). On the ATS (Appendix D), indicate the fraction of assignments the student correctly recorded in the notebook for each day. A fraction can be created by comparing the student's performance to what was expected (i.e., validation system).
 - For example, if the student correctly recorded one assignment but had three assignments due, the student would receive a 1/3, or 33%.

3. Correct unmet criteria. If the student does not have the correct assignment recorded, the mentor should have the student write down the correct assignment after recoding the score in the ATS. The mentor might say:

"It seems like you forgot to write down the assignments for your math class. How can you find out what is due?"

4. **Provide feedback.** The mentor should provide specific feedback to the student about the areas in which they are succeeding and areas for growth. The mentor might say:

"You are doing an excellent job remembering to write down your assignments in your language arts class!"

"It seems like you are struggling to write down assignments in your math class. What makes that class different than the others? How might you help yourself remember to write down assignments?"

Timeline

This intervention typically takes 1 to 2 months of consistent implementation (i.e., meeting 2-3 times per week), but student response varies. If a student is not responding within 6 weeks, please consider the "Troubleshooting" section.

Ending the Intervention

- **Mastery**. If the student earns 100% for three weeks in a row, the mentor may consider fading the assignment tracking intervention.
- **Fading**. Fading begins by reducing prompts and behavioral contingencies in place. When teachers' reports indicate that the student is turning his/her work in on time and/or all prompts and behavioral contingencies have been removed and the student earns 100% for another two weeks, begin tapering the intervention. Tapering may begin with reducing the number of teacher initials that are expected (if this proves necessary), or by reducing the classes that are checked. In either event, determine if the reduction of this intervention leads to a reduction in completed work; if it does, return to regular meetings and original expectations.
- **Relapse**. If teachers report that the student is no longer turning work and homework assignments in on time, return to regular meetings and require that teacher's initial the ATS (or comparable system) to ensure accuracy.
- **Spot checks/booster sessions**. Conduct a surprise check after the intervention ends just to confirm that the student does not relapse.

Assessing Impact

At the end of the intervention, ask the teachers who provided baseline data to complete the same rating scale again and compare the pre- and post-intervention scores. A behavioral consultant (e.g., school psychologist) can assist when interpreting change.

Troubleshooting. Common problems and their solutions are as follows:

- **Student seems unmotivated.** Start with praise as the primary reward for assignment tracking success, but if the student is not obtaining 100% on some checks after three weeks, consider adding a privilege or tangible reward for a specific target threshold on the ATS (e.g., five minutes of computer time at the end of class if 80% of math assignments were recorded accurately). If the student is motivated to play the game, provide "unlock codes" for real-world progress (Appendix J).
- The assignment validation system fails. We have found that the single most reliable validation system for assignments is <u>teacher initials</u>. Specifically, students are coached to ask their teachers to initial the ATS (or comparable system) to verify that what the student has recorded is accurate. Although potentially onerous, this approach tends to outperform websites, homework hotlines, and other methods.
- Student fails to get teacher initials. When requiring teacher initials, it is not uncommon for students to skip this step. If this occurs often, make school privileges contingent upon exceeding a certain criterion on the ATS. Such school privileges might include choosing where to sit at lunch, having free time in the hall before school, and/or other privileges specific to the context of the school. Also consider sharing the ATS with the student's parents and encourage them to provide weekend privileges based on achieving a certain criterion on the ATS for the week.
- Student cannot remember/does not turn in long-term assignments. Encourage students, teachers, and parents to look back in the notebook on a regular basis to see if there are any current long-term assignments. You may also consider suggesting that the student keep a separate tracking list of long-term assignments. A long-term assignment page may be inserted into the assignment notebook for this purpose. Or if the student is using an online tracking system, a task list may be added (e.g., Google Tasks).

4.3. Note Taking

Intervention Objectives

Students will be able to meaningfully arrange materials learned from class instruction.

Intervention Outcomes

At the end of this intervention, students will be able to:

Attend to a classroom lesson and take complete and accurate notes that can be used for studying.

Materials You Will Need

- ATHEMOS game/computer/controller
- Lesson notes identifying main ideas and supporting details from recent classroom presentations
- The student's notebook with attempts to take notes in classes
- Writing utensils

Special Note: Procedures for the note taking intervention will vary depending on (a) whether the mentor is a classroom teacher; and (b) the expectations for note taking in the classroom. The following guidelines are written for mentors who serve as a teacher in a classroom where note taking is required. Alternative procedures are offered in the "troubleshooting" section.

Baseline Data Collection

To assess the student's pre-intervention performance level, we recommend the following:

- Classroom Performance Survey (CPS; Adolescent Subcommittee of C.H.A.D.D.'s Public and Professional Education Committee, 1996). The CPS is a brief, no-cost teacher rating scale. Prioritize reports from core course teachers (Language Arts, Math, Science, and Social Studies) because those classes typically place most demand on note taking (updated and reprinted in Appendix G).
- School Functioning Scale (SFS)-Teacher (DuPaul et al., 2019). As an alternative to the CPS, mentors might use the SFS-Teacher to track student progress on this outcome (Appendix H).
- Review the student's game performance log from ATHEMOS (see Section 3).

Before Starting the Intervention

Before starting the intervention, the mentor must determine the following:

• A way for the mentor to check the accuracy and completion of the student's notes from class. To accomplish this, mentors will need a copy of the expected notes (i.e., a gold standard) to compare the student's performance to. The preferred method for assessing completion and accuracy of notes is detailed below. For alternative methods, please see the "troubleshooting" section.

Introduce the Real-World Intervention

After the student has played ATHEMOS for two weeks (or 60+ total minutes), meet one-to-one to accomplish the following:

- 1. Look for in-game success. Using the teacher portal (see Section 3), the mentor can examine game progress to assess the degree to which players have made progress in the note taking puzzles. Success in the game provides examples when discussing strategies to transfer this skill to the real world. A lack of success might indicate that the student has difficulties identifying *main ideas* and *supporting details*, which might necessitate special instructions about those key terms and then additional practice in the game.
- 2. Explain the ATHEMOS analogy. After the student has some success in the game, review the outline format used in ATHEMOS to organize information about the aliens. Then explain how this system can be used to organize information from classes. The key is to identify main ideas and supporting details, and then to arrange them accordingly. In the game, note taking is introduced in the following way:

<u>CHP dialogue</u>: "You must help the Silent Canopy team understand the intel you have collected. To do so, sort the intel into main ideas and supporting details... Main ideas go next to Roman numerals. Supporting details go next to letters. Main ideas are big concepts, like people, places, or things... Supporting details tell us something about the main idea. Each main idea will have several supporting details. The intel you collect from the aliens must be sorted in this manner. The aliens' intel, when sorted correctly, will tell us all about them."

The mentor might say:

"In the game, you had to sort the extraterrestrial intel into main ideas and supporting details, with main ideas next to Roman numerals and supporting details next to letters, in an outline format. That same strategy can be used to record discussions in your classes at school."

3. Introduce note taking procedures using an ATHEMOS example. Explain to the student the outline format that will be used to take notes is like the format they use to organize "intel" in ATHEMOS. Although the format might vary, all notes must include main ideas and supporting details. It is helpful to ask the students questions to make sure they understand the outline format before you continue:

"For example, you had to organize information about locations in our solar system with the engineer:" Then show the following (see Appendix E):

I. Asteroid Belt

- a. 241 million miles from sun
- b. Between Mars and Jupiter
- c. Contains planetoids and dwarf planets
- II. Trojan Asteroids
 - a. 484 million miles from sun
 - b. In orbit with Jupiter
 - c. In front of and behind the planet
- 4. Relate the example to the student's current note taking skills. It is important to compare the example to the student's current system for taking notes in class. The mentor might ask:

"Show me what you have been doing to follow along in class." (Looking at attempts in the student's notebook)

"How might you apply the strategies you used in the game to what you do in class during presentations?"

5. Introduce note taking procedures. Begin by applying the outline format to examples of materials from the student's notebook (e.g., worksheet, existing notes). Use these materials to provide instruction on proper note taking. The mentor might ask:

"What was the main idea(s) of this lesson?" "How do you know?"

"What were the supporting details?" "How do you know?"

"How might you reorganize this information in an outline format?"

If possible, try to identify both successful and unsuccessful notetaking examples from the student's existing materials and compare the student's ability to remember the meaning of those materials. Successful notetaking promotes recall, and that benefit might be demonstrated using existing materials.

In-class Activities (Involving the Whole Class)

- 6. Begin using the note taking procedures in class. Once the student seems to understand the outline format, live class activities can begin (assuming the mentor is a classroom teacher). In the early stages, mentors are encouraged to model the notes (e.g., chalkboard, chart paper, PowerPoint) so the students can see what they are to reproduce. Stop the activity frequently to discuss how the notes should be structured, highlighting the important points. Use the "think out loud" technique (verbalizing your own thought processes as you write notes) to show students how to generate main ideas and supporting details on their own and then write them in outline format. Use this time to encourage students to use various methods to reduce the amount of writing required (e.g., write "... = ..." before a definition instead of "... is a ...", or "+" instead of "and," or only write out the full name once and after that use initials).
- 7. Taper prompts for notetaking. As students begin to understand the note-taking procedures, mentors taper the prompting and begin the transition to student-generated notes. Mentors also gradually model less during their classroom presentation. The mentor might prompt the class by asking:

"How would I write this down in my notes?"

"If I don't want to write all of that, how might I shorten it?"

Subsequent Meetings with Target Student

8. Monitor student note quality over time. Mentors then monitor the target student's performance over time using one of several means: (a) collect and grade notes; (b) directly observe note taking during class and provide a rating; or (c) use both *a* and *b*. In any event, it is important to schedule 2-3 meetings each week to review and provide feedback on the student's notes.

- 9. Score the completion and accuracy of the notes. To determine completion and accuracy of the notes, the mentor should record the percentage of main ideas and details the student accurately records in his/her notes. To do this, use the number of main ideas or details from the lecture's notes as the denominator and the number of main ideas or details in the student's notes as the numerator.
- **10.Provide feedback.** Graph the data (percentage correct) generated from the student's notes to track success over time. Discuss ways the student might correct any missed items prior to the next session and praise <u>effort</u> using specific, descriptive language. For example:

"Your notes appear to be improving. The percentage of correct main ideas has increased since your first attempts."

"What are some things you could do in tomorrow's class to ensure that you record all of the supporting details?"

Tools for graphing single-case data are available online at <u>www.athemosthegame.org</u>

Timeline

Previous studies using these techniques have found that middle school students with ADHD who receive daily instruction and practice can learn to take notes independently in two weeks. Though some students will take longer, most achieve mastery from daily instruction within a month. Less frequent instruction and practice will extend this timeline.

Ending the Intervention

- **Mastery**. Mastery is reached when the student has achieved at least 85% total accuracy for both main ideas and supporting details on 3 consecutive sets of notes taken from class activities.
- **Fading**. As the student progresses, you should begin to limit the interruptions of the lecture to a discussion of notes being recorded and questions about the material being covered. Gradually lessen these discussions of how the notes should be recorded until students are able to record the notes accurately and completely on their own.
- **Relapse**. If at any point it appears that the student relapses to 'old habits' of poor or no note taking, return to regular meetings.
- **Spot checks/booster sessions**. Conduct a surprise check after the intervention ends just to confirm that the student does not relapse.

Assessing Impact

At the end of the intervention, ask the teachers who provided baseline data to complete the same rating scale again and compare the pre- and post-intervention scores. A behavioral consultant (e.g., school psychologist) can assist when interpreting change. Change metrics (e.g., effect sizes) quantify the degree to which the intervention was helpful and can guide decision making within multitiered systems of support.

Troubleshooting. Alternative methods of implementing this intervention are as follows:

- Student seems unmotivated. Start with praise as the primary reward for note taking success, but if the student is not meaningfully improving in their classwork, consider adding a privilege or tangible reward for a specific target threshold for note taking accuracy or test/quiz scores. If the student is motivated to play the game, provide "unlock codes" for real-world note-taking progress (Appendix J).
- The mentor is not one of the student's core teachers. In such instances, it is important for the mentor to form a relationship with the student's classroom teachers to implement this intervention and determine the expectations for note taking (e.g., guided note taking). If mentors have access to those materials, it is possible to score notes found in the student's notebook against teachers' expectations.
- **The student is not required to take notes for class**. Even when note taking is not expected, it can be helpful for students with ADHD to take notes in class because it can increase engaged learning in the classroom. Thus, we encourage mentors to expand this intervention into all four courses over time.

Appendix A: Examples of Organization Tracking Sheet (OTS) Items

The following items can be used to create an individualized organization system for the student. Choose the items that meet the student's needs and preferences or create your own (ideally in collaboration with the student), then add the selected items to the OTS (Appendix B). Use up to 15 criteria (typically 9 - 11 work best).

- 1. Is your assignment notebook secured by three rings so that it is the first thing you see when you open your binder?
- 2. Is your binder free of *loose papers* (are **all** papers secured in folder pockets or attached by the three rings)?
- 3. Is the Homework Folder attached by three rings behind your assignment notebook?
- 4. In the Homework Folder, does the Homework Folder only contain homework sheets?
- 5. In the Homework Folder, is homework TO DO in the *left* pocket (along with any parents that parents need to view) **and** is completed homework that needs to be TURNED IN located in the *right* pocket?
- 6. Is there a folder for each class you are taking *attached by three rings* (Math, Science, Language Arts, Social Studies, P.E./Health, other extracurricular courses)?
- 7. Are all worksheets (non-homework papers and notes) in the correct subject folder?
- 8. Are **all** notes from each subject organized from oldest to newest behind the subject folder and secured by the three rings in the binder?
- 9. Are **all** the papers that are in the binder school related (no drawings, scrap paper, personal notes, etc.)?
- 10. Is the pencil bag used **only** to hold pencils, pens, calculator, and erasers (or other relevant school supplies)?
- 11. For students with an electronic planner: Is the electronic assignment planner easily accessible with all relevant assignments recorded?
- 12. For students with electronic notebooks: Are all notes for each subject *organized in different files* (correctly labeled) from oldest to newest?
- 13. Are long-term assignments stored in a separate folder that only contains papers related to longterm assignments?
- 14. Are incomplete assignments stored in a separate folder that only contains assignments that are incomplete and need to be turned in?
- 15. For students who want to individualize their notes: Are all notes from each subject organized by ?
- 16. For students who want to individualize their folders: Are all worksheets (non-homework papers and notes) stored in _____?

Appendix B: Organization Tracking Sheet (OTS)

Compare the binder, bookbag, <u>or locker to the checklist below:</u> For each item, write a "Y" (for yes) if the criterion is <u>fully</u> met, or an "N" (for no) if not. Put the date at the top of the column and check each criterion, recording a "Y" or "N" in the appropriate space. When finished checking all items, calculate the percent correct for each day by dividing the number of Ys by the total number of items on the list.

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PERCENTAGE OF CRITERIA MET FOR THE DAY:												

Appendix C: Assignment Tracker/Planner

\bigcirc	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SAT/SUN
SCIENCE	A					
LANGAUGE ARTS						AC60
матн						
SOCIAL STUDIES						20
OTHER	1133	習合之			2	1 miles
	114GE	1111125	学習度	A. 3		5.
OTHER						

Appendix D: Assignment Tracking Sheet (ATS)

Mentor: Check the student's assignment tracking system and record performance using the sheet below. Each date produces a fraction of assignments recorded correctly over the total amount expected for that day. Teacher initials can be added as a verification system when other sources of information prove unreliable and student performance on that element can be tracked separately.

Date											
Teacher signatures expected? $$											
# teacher signatures obtained											
# assignments written correctly											
# assignments expected											
Date											
Teacher signatures expected? $$											
# teacher signatures obtained											
# assignments written correctly											
# assignments expected											
Date											
Teacher signatures expected? $$											
# teacher signatures obtained											
# assignments written correctly											
# assignments expected											

I. Asteroid Belt

- a. 241 million miles from sun
- **b. Between Mars and Jupiter**
- c. Contains planetoids and dwarf planets
- II. Trojan Asteroids
 - a. 484 million miles from sun
 - b. In orbit with Jupiter
 - c. In front of and behind the planet

Appendix F: ATHEMOS Journal

In the spaces below, record the clues you find around the Silent Canopy base. Try to keep your notes as short as possible!

CLUE Ø1:	CLUE 10:
CLUE 02:	
CLUE Ø3:	
IABBU	
CLUE ØH:	
CLUE 05;	CLUETK
CLUE Ø G :	CLUE 15:
CLUE 07:	CLUE 16:
	1657
CLUE Ø8:	CLUE 17:
CLUE Ø9:	CLUE 18:

Appendix G: Classroom Performance Survey

Teacher Name:

Student Name:

Date Completed:

Subject Taught:

Please read each item carefully and circle the number that best describes this student's behavior for the *past 4 weeks*, to the best of your knowledge.

	Always		Sometimes		Never
1. Brings necessary materials to class.	1	2	3	4	5
2. Completes class assignments.	1	2	3	4	5
3. Completes homework on time.	1	2	3	4	5
4. Records assignments consistently.	1	2	3	4	5
5. Turns in completed work.	1	2	3	4	5
6. Completes long-term assignments.	1	2	3	4	5
7. Attends to instructions in class.	1	2	3	4	5
8. Arrives to class on time.	1	2	3	4	5
9. Cooperates/participates in class.	1	2	3	4	5
10. Demonstrates skills in reading assigned tests and materials.	1	2	3	4	5
11. Demonstrates adequate spelling and writing skills in work.	1	2	3	4	5
12. Takes notes in class to study.	1	2	3	4	5
13. Performs satisfactorily on tests.	1	2	3	4	5
14. Completes assigned work with accurate computation/detail.	1	2	3	4	5
15. Completes assignments legibly.	1	2	3	4	5
16. Relates positively to teachers.	1	2	3	4	5
17. Demonstrates respect for property.	1	2	3	4	5
18. Relates positively to peers.	1	2	3	4	5
19. Communicates own needs or asks questions.	1	2	3	4	5
20. Accepts assistance when needed or offered.	1	2	3	4	5

21. Please add any additional skills, behaviors, or concerns that you feel have an impact on this student's classroom performance and achievement:

22. In the past month, what percentage of this student's assignments were turned in completed and on time? %

- 23. What percentage of assignments are handed in completed and on time by the average student in your class? %
- 24. Is this student working up to potential? Circle:

No

Yes

Appendix H: School Functioning Scale (SFS) – Teacher

Teacher Name:	Student Name:
Date Completed:	Subject Taught:

Please rate the <u>student's skill competency</u> in each of the following four areas of performance <u>over the last month</u>:

	Domain 1	Domain 2	Domain 3	Domain 4
	Classroom Preparedness	Classroom Participation	Homework Completion	Test/Quiz Grades
5 – Mastered	Student typically has required classroom materials 5 out of 5 days (or 100%) per week	Student typically participates in class 5 out of 5 days (or 100%) per week	Student typically completes 90-100% of homework assignments per week	Student's average test/quiz score is 90- 100%
4 – Accomplished	Student typically has required classroom materials 4 out of 5 days (or 80%) per week	Student typically participates in class 4 out of 5 days (or 80%) per week	Student typically completes 70-89% of homework assignments per week	Student's average test/quiz score is 70- 89%
3 – Developing	Student typically has required classroom materials 3 out of 5 days (or 60%) per week	Student typically participates in class 3 out of 5 days (or 60%) per week	Student typically completes 60-69% of homework assignments per week	Student's average test/quiz score is 60- 69%
2 – Emerging	Student typically has required classroom materials 2 out of 5 days (or 40%) per week	Student typically participates in class 2 out of 5 days (or 40%) per week	Student typically completes 50-59% of homework assignments per week	Student's average test/quiz score is 50- 59%
1 – Minimal	Student typically has required classroom materials less than 2 days (or less than 40%) per week	Student typically participates in class less than 2 days (or less than 40%) per week	Student typically completes less than 50% of homework assignments per week	Student's average test/quiz score is less than 50%

Please rate the student's classroom behavior <u>compared to a typical peer</u> (of the <u>same gender</u>) over the last month:

	1 Much Less Problematic	2 Somewhat Less Problematic	3 No Difference	4 Somewhat More Problematic	5 Much More Problematic
Non-compliant BehaviorsExamples include but are not limited to the following: Student might• Arrive to class late• Not follow rules, instructions, and directions• Refuse to finish assignments or complete tasks					
Disrespectful Behaviors Examples include but are not limited to the following: Student might • Engage in disrespectful verbal/nonverbal interactions with peers • Engage in disrespectful verbal/nonverbal interactions with adults • Use foul language • Not respect others' property and/or space					
 Disruptive Behaviors Examples include but are not limited to the following: Student might Ask inappropriate and/or irrelevant questions Make inappropriate noises and/or jokes Display other negative attention-seeking behaviors (e.g., chronic blurting out, excessive helplessness, tattling, bragging, whining) 					

Please rate <u>your level of agreement</u> with the following statements based on the student's classroom behavior <u>over the last month:</u>

	1 Disagree a lot	2 Moderately disagree	3 Disagree a little	4 Agree a little	5 Moderately agree	6 Agree a lot
1. This student gets along well with teachers.						
2. This student gets along well with peers.						

Please use the following blank page to provide any questions/comments you might have.

Appendix I: ATHEMOS Stickers

On the following pages are images that, when printed to sticker paper, can be used to decorate the student's binder and planner to aide the transfer of skills taught in the game.









* Alternative stickers for the front of each subject folder; print in grayscale if you do not use this color scheme



Appendix J: Codes for In-Game Rewards

The codes below can be entered into ATHEMOS in the CHP "chop shop" to unlock special in-game rewards. Mentors can use these codes to encourage students who are struggling in the game, or to reward improved classroom behavior.

Food-themed Skins



Doughnut Skin Code: xqAiRzZQ



Pizza Skin Code: deeobGM9



Spaghetti Skin Code: p50yN4KA

Animal-themed Skins



Giraffe Skin Code: bRcUopjG



Parrot Skin Code: 3Yx3W76H







Shark Skin Code: MNcgi9Pj



Smiling Shark Skin Code: WhaX4wVj



Snake Skin Code: 4k9NWykw



Tiger Skin Code: rXmTNDj8



Zebra Skin Code: CbkAevGm

Missile Skins





Camo Missile Code: EJTK3WSG



Tank Missile Code: 4SFZMQD9



Hazard Missile Code: 5JVE7P3H



Carbon Missile Code: JPof8QF4



Gold Missile Code: 7CNL5TJ5



Cyber Missile Code: FCXMSU54

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