

# **MatchCard**

# **Science**

## **Instructor's Guide**



**Light & Energy**  
**Weather & Atmosphere**  
**Force & Motion**  
**Geology**  
**Oceanography**  
**Human Anatomy**  
**Chemistry**  
**Astronomy**  
**Botany**  
**Zoology**  
**Nutrition, Health, & Safety**  
**Technology**

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## **Instructor's Guide**

### **Objective Science Unit Studies**

Science should be one of the favorite subjects for all kids. After all, science is the study of how things work; and what child doesn't like things?

But frequently, science becomes a vocabulary quiz, and "studying science" may consist largely of cramming for the science vocabulary test. And that certainly doesn't sound like an enjoyable past time. And how profitable is it? Do you remember (or care) what a granulocyte is?

But science concepts – and the accompanying vocabulary – are valuable to know. Much of the advancement of society is due to the systematic study of how things work. A goal of MatchCard Science is to help students master key scientific concepts the way students learn best.

MatchCard Science uses a unit study approach. Unit studies allow a student to learn a topic utilizing learning methods and resources that are geared to their learning styles. With unit studies, students in different grades can study the same unit while each is learning at their own rate and with strategies best for them. The self-directed approach developed through unit studies produces a lifelong desire to learn. Many families, however, who have used unit studies, have found a few obstacles with this approach. MatchCard Science was developed to overcome these obstacles.

First, some families have designed unit studies and provided a variety of learning activities to engage their students; yet felt uncertain at the

end if their students had actually achieved any academic progress. Without tests to grade, it may seem difficult to measure success. To meet this need, MatchCard Science lists the science objectives students should master before high school and provides a MatchCard activity for each of these objectives. At the rate of approximately one to two objectives per week, it is simple to measure the student's progress through the curriculum. During the week, the student can pursue self-directed and teacher-directed activities using a variety of resources to learn the concept. The MatchCard acts as a backbone that provides structure to the course of study, yet does not dominate or diminish hands-on activities.

MatchCard Science also provides built in review by encouraging students to review five previously learned MatchCards each day. This ensures retention of material in only a few minutes of time. The students will master the basic science concepts and progress through a scope and sequence without giving up the advantage of family directed unit studies.

MatchCard Science addresses another challenge faced by many families who have used unit studies: burn out. "How do you know when you're done?" some parents have asked. "No matter how much we do," one mother complained, "I feel we have only scratched the surface and their education will suffer if we don't do more."

She is right: there is always far more that could be done than any one family can do. This can lead to burn out in families who try to do it all; and guilt in those who don't.

To address this concern, MatchCard Science encourages families to use a simple format. Six Objectives, three resources (3 in), one science project (1 out) and bonus points chosen by the student for additional activities make up your unit study. At least one of the three resources should be a book. The other two can be books, journal articles, videos/DVD's, science games or kits, or any other resource relevant to your unit of study. Since most unit studies will be about six weeks long, this works out to be approximately one book or resource every two weeks.

In addition to three “ins”, the student will have one “out” – which is a science project he or she does over the weeks of the unit. A list of possible science projects is included at the beginning of each module. But the possibility of projects that might be undertaken is endless.

“Isn’t that a little *too* simple?” some have wondered. However, if you multiply the activities out over six 6-week unit studies, that translates into 18 books (or other resources) read and six science projects assigned in a year. That is certainly a satisfactory amount of material listed for a basic year’s study.

Of course, we do not want to limit a student’s studies to a minimum requirement, but want to encourage them to explore areas of interest. Therefore, the students may choose additional activities to earn additional bonus points. Points are awarded at the rate of approximately six points per hour (or 1 every ten minutes.) The students may work with additional resources or do

additional science projects in order to earn points.

Finally, there is another challenge to unit studies that MatchCard Science makes easier – the planning process. How many times have parents intended to put together lesson plans over the weekend, only to have Monday morning roll around all too soon with academic planning left undone? MatchCard Science Unit Studies are ready when you are not. It is great when you can take the time to prepare your unit study in advance; but you can also do your planning with your students as one of the lessons. So if Monday morning rolls around and they are ready for science but you are not, the unit study preparation can be your first lesson.

### *Getting Ready*

Each unit study lists the objectives expected of students prior to entering advanced science courses for high school. As a general rule of thumb, it helps to plan for one objective per week. Because some of the foundational objectives may be quite simple, some weeks you are likely to do two objectives. The first step to getting ready is to decide what objectives each student will cover in the course of study.

There are two different time-schedules you can use for MatchCard Science. In the first, each unit will be six weeks long, with a total of six units in an academic year. Or you may chose a different time schedule since some units tend to have more content then others. In that case a unit study schedule might look more like this:

Light and Energy	8 weeks
Weather	4 weeks
Force and Motion	4 weeks
Geology	8 weeks
Oceanography	4 weeks
Chemistry	8 weeks

If you have a student in 5<sup>th</sup> grade or higher, some of the objectives will be material they have already covered in previous years. In this case, depending on the students and their level of confidence with previously learned material, you may find it helpful to have a review week. During the review week, you may cover several objectives of familiar content. For instance, most in 5<sup>th</sup> and 6<sup>th</sup> grade are quite familiar with the states of matter (solid, liquid, and gas) and would not need to take a week to study it. But while they are usually very familiar with concepts like melting, freezing, and evaporation; many students could use a review of condensation. Taking a week to review previously learned objectives helps the students fill in the gaps.

On the other side of the scale, your younger students may not be able to achieve the latter objectives due to the complexity of those concepts. Those objectives can be presented in future years when the student is older.

After choosing the objectives for each student, the next step to get ready for your unit study is to acquire the three or more resources.

There are few suggestions that might make your search for materials more profitable. First, your students can be a real asset in looking for materials; both within your home and in the library. In fact, since you already know what six

unit studies you will be pursuing for the academic year, it may be helpful to have a place on the bookshelf where potential resources can be placed for future unit studies. This can include not only the books or news articles; but also lists of materials that may be found elsewhere. That could include list of library books at your local library you can't check out months in advance. It could also include articles in reference books in your home that are usually kept in another location.

If finances are available, students often enjoy having one new resource for each unit. Hands-on kits and games are particularly beneficial to many students. Many companies specialize in providing either science kits or home schooling supplies and offer a variety of products that would add appeal to your unit studies.

Once the three (or more) resources have been located, next they need to be previewed to determine which resources cover the specific objectives best. Since the objectives in MatchCard Science cover the core content of each unit, this should not be difficult to find in your resource material.

Often, you may find one particular book works best as the main source, and the others more as supplemental material. Of course, it depends largely on what resource materials you have.

There are approximately 30 academic days in a six week unit study; or 20 days in a four week unit and 40 in an eight week unit. Knowing the number of days, will help to determine how many pages the students need to do from the resources in order to cover the material in time. It is common for students to

read about 2 to 3 pages per day, three or four times per week.

Finally, choose a science project to assign for the student to do. They may like to take part in choosing this project.

This preparation time should take approximately one hour for each unit. That, of course, does not include driving or shopping time. And allowing the students to help in the preparation is a valid learning experience for them as well.

### *Studying the Unit*

At least once a week, the student will begin learning a new objective. Some students learn best with an oral presentation. In that case, the teacher sits down with the student and explains the material. The accompanying MatchCard may be used to illustrate the concepts. Other students prefer to learn independently. They enjoy looking up the information contained on the MatchCard in their resource material. Either way, the teacher has an answer key to ascertain that the student has learned the concepts correctly. Some students also like to color the MatchCards as they learn the material.

Also, the student is encouraged to review previously learned MatchCards at a rate of approximately five each day. At the end of this Instructor's Guide, there are instructions telling how a notebook can be set up to allow for on-going review. Of course, students can't start reviewing five objectives per day until they have been doing MatchCard Science long enough to have learned a number of objectives. The objective currently being learned should be

reviewed every day for the first three days or until it is well-understood. Some of the more complex objectives may require a longer period of review.

In addition to the MatchCards, the students will also be reading and interacting with the other resources chosen. Also, they will have their science project to complete. It is highly recommended that the science project is assigned with a due date and students have an understanding of how they need to pace themselves to finish the project by the due date. It is beneficial to make the due date of the science project at least three academic days before the final date of the unit study. That leaves time to complete all work and put together a Unit Study Booklet.

In addition to the minimum required work of using three resources and completing one science project, students may also complete additional work of their choice. Most families that use unit studies incorporate other areas of learning; such as art or writing, with their unit study. Allowing the student to self-choose and self-direct their studies is a proven strategy to enhance learning.

Some students demonstrate their learning by creating their own MatchCards for their bonus points. For instance, if a student is studying Botany, and does additional work identifying different trees in their local area, they might create a MatchCard with that information to add to their notebook.

There is no hard and fast rule about how much time a student needs to spend in a subject each week. A general rule of thumb is five minutes a day per grade level. Therefore a first grader would be

expected to do five minutes a day of science; a fourth grader would do approximately 20 minutes a day; and a tenth grader would do approximately 50 minutes a day. Students in fourth grade and younger may work on science for longer periods at a time, in fewer days during the week. For instance, instead of doing 20 minutes five times a week, they might do 35 minutes of work three times a week. Once the minimum assigned work is completed, students can spend the remaining allotted time on self-directed activities related to the unit of study.

#### *Unit Study Booklet*

It is recommended that the unit be completed with the assembly of a unit study booklet. This will include, at a minimum, the list of resources used and information and pictures on the science project that was done. In addition, other projects can also be included. Many students enjoy making the cover and putting the booklet together. The cover can consist of art work the student does for it, or it may give them the opportunity to explore different printing and graphic options on the home computer.

Some families leave the Unit Study open throughout the year. That way a student can add additional writings, art work, science projects, or list of other books read if the topic is of interest to him or her. On the other hand, some families prefer closed unit studies with a final date and closure point.

#### *Flexibility*

One of the greatest benefits of unit studies is their flexibility; and

MatchCard Science maintains that flexibility while providing some structure to ensure academic progress. There is no limit to the way families can use this content in order to study science, create a desire for learning, and integrate with other subject areas.

#### *Other Ideas*

MatchCard Science can be used as a stand alone unit study just for studying science as described above. Others have used it as an integrated unit study and incorporated other areas the students are learning into the science topic. This includes reading, essay writing, creative writing, vocabulary, art, and math; to name a few. For instance, if they are learning to write paragraphs in their study of English, they would assign that to correlate with their science unit study. If they are learning to draw certain types of figures in art, that could be used to demonstrate a science concept.

Some families have had students make vocabulary lists from words they have learned on the MatchCards. These words can also be used for spelling.

MatchCard Science can be used as supplemental material with another unit study. Many families have purchased unit studies that are based on history, or literature and incorporated the study of science as well. The appropriate MatchCards can be utilized in the much the same way as described above, but will be presented in the order that fits with the primary unit study the family is using.

# Instructions for the MatchCard Notebook

## Recommended Use

For durability, each MatchCard activity sheet should be placed in a plastic sheet protector, and then stored in a three ring binder.

The Information Pieces can be found in the back of each module. As the student does the activity, they will place each Information Piece at the appropriate place on the MatchCard. For durability of the information pieces, we recommend that you place clear tape or clear contact paper over the front. This will provide a lamination-like surface.

A small piece of tape can hold the Information Piece to the page protector, which will prevent the piece from being knocked off by movement or wind. The tape can be left on the Information Piece and be used repeatedly.

Between uses, the Information Pieces can be removed from the front of the page protector and taped randomly to a sheet of waxed paper. The waxed paper can be placed inside of the sheet protector.

A small letter-number combination is included on each Information Piece to identify which MatchCard it goes with. In the event a piece does get knocked off a table, it can easily be returned to the correct page protector.

You might find it easiest to separate all the Information Pieces according to which objective they belong to and place all pieces for a particular objective in the appropriate page protector. You do not need to cut apart each individual piece until it is time to use that objective card.

It is helpful to arrange your binder in three sections: 1) the very front section has one or two objectives the student is currently learning; 2) the middle section contains the objectives that have been learned and will be reviewed periodically; 3) the back section contains the objectives that have not yet been learned.

## Teaching with MatchCards

Usually you will present one, or perhaps two, objectives each week. You may choose to wait until that time to cut apart and tape each Information Piece.

Look at the Answer Key. This can be your guide for teaching the objective, as well as an answer key for correcting the students' work.

You may choose to store the Answer Key in the back of the same page protector; or you may wish to keep a separate binder just for the Answer Keys.

In many cases, the written materials the student reads will cover the same information contained on the MatchCards. Your student may enjoy reading independently and finding the answer themselves.

Others learn best by having the information presented orally and then reading other sources for reinforcement.

The MatchCards can easily be colored by crayon, colored pencil, or marker to individualize a student's work.

## Reviewing the MatchCards

Objective Science was designed for continuous review and reinforcement. For two or three days after a new objective is learned, the student should reapply the Information Pieces to the activity card every day. Keep the newest objective cards at the front of the three ring binder.

After the student has successfully demonstrated completion of the objective, move the card from the front section to the middle section of your binder. Every day the student should review approximately five cards. This takes only a few minutes to do. If the student gets the reviewed cards correct, place it in the back of the middle section. If the objective is not mastered and needs to be reviewed again sooner, place it towards the front of the middle section. It will not take very long until the middle section is shuffled from the order the cards were presented. This is acceptable, and will help reinforce content the student is less familiar with.

## Recommended Materials

Page protectors, three ring binder, tape, waxed paper, 2 colored sheets to separate binder sections

Optional: Coloring materials, additional binder for teacher's answer keys