Middle School Physical Science

Course Overview: Why should I be excited about MS Physical Science?
You should be excited because you'll be designing, modeling, explaining and analyzing as you engage with fundamental science ideas related to three HUGE questions: 1. What are we? 2. Where are we? 3. What makes us go? You'll be spending time both in the classroom and outside (a lot more this year!) and will have opportunities to demonstrate your learning in varied and creative ways...like building stuff (including campfires!), making movies, creating art, applying math, and pondering and questioning our world (and beyond). Lastly, you'll consider—and, I hope, directly experience—how all of this relates to our year-long theme, “Science is done, not memorized!” Let's science!

MAJOR UNITS/QUESTIONS: What do we learn about in this class?

What are we (and everything else)? We'll start the year focusing on matter and its interactions. We'll dive into what matter is, why its properties are so important and how matter that we can’t see has such a huge impact on the matter, and behaviors of matter, that we can see. It’s all about tiny particles!

Where are we (in our cosmic neighborhood)? The middle portion of the year will be dedicated to considering Earth’s place in the solar system, how we compare to our cosmic neighbors, some of the predictable patterns that exist in our solar system—and their causes, and big questions about what else is—and might be—out there!

What makes us (and everything else) go? To conclude the year, we’ll explore energy, how it makes so much happen, and how it is a thread that runs through all that we’ve learned in class. We’ll also look at how energy moves in the form of waves and how/why heat is everywhere. Ever wondered what the hottest thing is in the Universe? Coldest? Does “cold” even exist? We’ll get into all of this!

What does it mean to do science? We’ll continually explore who scientists are, as well as where, how and why do they do their work. We’ll also keep our eyes out for exciting science that is being done around the world—or outside of it—right now! Did you know a rover is landing on Mars in February?!

STANDARDS: What knowledge and skills will I gain by the end of this course?

Anchor Standards: MS Physical Science will assess knowledge and skills you build across four Anchor Standards.

Modeling - Developing and using scientific models (including explanatory and physical models, as well as those in which you are an active participant in the model)

Explaining - Constructing scientific explanations (in writing, verbally, and through video)

Analyzing - Analyzing and interpreting data (including data sets and graphs)

Designing - Engaging in project or engineering challenges using the design cycle

**Content Standards:** The following NGSS standards correlate with the Anchor Standards above. To ensure equal distribution across the Anchor Standards, some of the standards below will be adjusted. For example, the assessment for MS-PS1-5 will likely be adjusted to make it fit into the “Explaining” Anchor Standard.

Develop models to describe the atomic composition of simple molecules and extended structures. (MS-PS1-1)

Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. (MS-PS1-2)

Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. (MS-PS1-4)

Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. (MS-PS1-5)

Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. (MS-ESS1-1)

Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. (MS-ESS1-2)

Analyze and interpret data to determine scale properties of objects in the solar system. (MS-ESS1-3)

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Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. (MS-PS3-3)

Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. (MS-PS3-5)

Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. (MS-PS4-1)

Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. (MS-PS4-2)

Design and run a Rube Goldberg Machine that accomplishes a given task in as many creative and distinct steps as possible...precedes and directly connects to MS-PS3-5

Design a storyboard for a video about a chemical reaction of your choice...precedes and directly connects to MS-PS1-2 & MS-PS1-5

ASSESSMENTS: How will my teacher and I know if I’ve learned what I need to?
For information about assessment types, scoring, and overall grade calculation: click here.

COMMUNICATION:

How do I access work from home, and what should I expect?
- All work will be posted in Google Classroom.
- The work will be explained during our in-person meetings, during required Wednesday synchronous sessions and/or by video posted to Google Classroom.
- The work will also be explained in our Class Planner posted to Google Classroom.
- If you have any questions, communicate with your teacher as proactively as possible! (In-person, by email, etc.)

How do I know my grades?
- On summative assessments, a teacher will provide both a 4-point grade and a letter grade.
- You can monitor your progress in the following ways:
  o By reading feedback and scoring returned on formative and summative assessments
  o By monitoring the scores and Overall Course Mastery Grade in the Parent/Student portal on JumpRope
  o By monitoring the grades sent home quarterly through report cards

Where can I find this syllabus during the school year?
This syllabus will be available on the school website under the science department tab once the school year is up and running. It will also be posted to Google Classroom.

How do I see what’s due?
Assignment and summative assessment due dates with handouts are posted in Google Classroom, with connection to Google Calendar, for student access.

**How do I see what's past due?**
If a student is missing an assessment, it will be listed in the red “Missing Assessment” section of the JumpRope Parent/Student Portal after scores for the assessment have been entered.

**Best way to contact me?**
See my contact info on the front page of this syllabus. Please be as proactive as possible!

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**MATERIALS:**
We will use a variety of learning materials and resources over the course of the class including handouts, websites, and occasional textbook readings. Most important will be your ability to navigate Google Classroom and to use a **three-ring binder** to organize handouts, notes, and summative assessment rubrics. These will add up fast!

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**SCHOOLWIDE PROCEDURES:**
Please see the Student Handbook for Procedures and Policies related to: Due dates and deadlines, extra credit, retaking assessments, and turnaround time for grade entry.

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**CLASS EXPECTATIONS:**
1. **Respect:** Your words and actions are important contributors to our shared learning environment. Respect for yourself, your classmates, Mr. Becker, and the property of others will be expected at all times.
2. **Responsibility:** It is your responsibility to arrive on time, organized and prepared for class. It is also your responsibility to communicate, **ahead of time** (whenever possible), if you have questions or will be unprepared for any reason.
3. **Participation:** Your full and active participation will be expected during every class. Participation has many forms—including active listening. Above all, full participation requires a positive attitude!
4. **Safety:** You must adhere to all safety procedures and precautions. Throughout the year you will work on numerous projects using a variety of tools and materials. We’ll also be outside building campfires. Safety must be a priority at all times.

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**CONCLUDING THOUGHTS:**
I care deeply about your experience in my class, in the eighth grade and in our school. I see myself—and hope that you see me—as an ally and a partner. Let’s have an awesome year together!