CLASSROOM LAW PROJECT proudly sponsors the **19th Annual Statewide**

2004-05 OREGON HIGH SCHOOL MOCK TRIAL COMPETITION

Andy Parker, et. al.

v.

Paradise County School District

The case of the hazardous homework

Co-Sponsored by
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CLASSROOM LAW PROJECT

OREGON STATE BAR
1935

November 2004

Dear Coach, Parent, Friend, Supporter:

Thank you. You are working hard to assure that a young person or persons in your life have the experience of a lifetime. Mock trial is unlike any other high school competition. Academics, knowledge of the judicial system, quick-wittedness and teamwork are at the core of this program where young men and women are on equal footing. You are instrumental in bringing this experience to them. It means a great deal to them to have your support.

If you haven't already seen positive changes in the students as they prepare for the competition, I know you will. While the high school mock trial is designed to clarify the workings of our legal institutions for students, a great deal more than that goes on.

The mock trial experience provides students with the opportunity for interaction with positive adult role models -- teachers, lawyers, and others. As students study our hypothetical case under their guidance, they acquire a working knowledge of our judicial system. You will notice an increased proficiency in basic reading and speaking skills; also critical thinking skills such as analyzing and reasoning; and interpersonal skills such as listening and cooperating. This hands-on experience outside the classroom is one where students learn about law, society, and themselves.

We ask for your help in continuing this successful program. Classroom Law Project, an Oregon non-profit organization, is the sponsor of the annual high school mock trial. Putting on the mock trial costs almost $30,000. Less than half of that comes from teams' registration fees. Classroom Law Project receives no funding from the State of Oregon. I know that you have been asked many times to give and I understand that your ability to do so may be limited. But to the extent that you can, please consider how valuable this program is to the young person or persons in your life and write a check accordingly. Any amount you can give is very appreciated; just send it to the address below. Your donation is tax deductible. Thank you.

Sincerely,

Marilyn R. Cover
Executive Director

ACKNOWLEDGMENTS

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Classroom Law Project adapted these case materials from a 1988 mock trial case from Tennessee. CLP gratefully acknowledges the primary authors of this case whomever they may be. Found among archived mock trial materials, this case bore the label of the Tennessee Bar Association with acknowledgements extended to the Constitutional Rights Foundation and the Wisconsin Bar Foundation. While the organizations today may not recall the efforts of their supporters from years ago, CLP joins them in recognizing the creative and hard efforts of those who made this case possible.

Special *thanks* to

All teacher and attorney coaches, regional coordinators, county courthouse personnel, attorneys, and other volunteers whose dedication and hard work make the regional and state competitions successful. Without their efforts, this event would not be possible.

Printing generously donated by IKON

CLASSROOM LAW PROJECT

2004-05 Oregon High School
Mock Trial Competition

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I. 2004-05 Mock Trial Competition

This packet contains the official materials which student teams will need to prepare for the Nineteenth Annual Oregon High School Mock Trial Competition.

Each participating team will compete in a regional competition. Winning teams from each regional will be invited to compete in the state finals to be held in Portland on March 11 and 12, 2005. The winning team from the state competition will represent Oregon at the National High School Mock Trial Competition in Charlotte, North Carolina, May 5-7, 2005.

The mock trial is designed to clarify the workings of our legal institutions for young people. In the mock trial, students portray each of the principals in the cast of courtroom characters. As the student teams study a hypothetical case, conduct legal research, and receive guidance from volunteer attorneys in courtroom procedure and trial preparation, they acquire a working knowledge of our judicial system. Students participate as counsel, witnesses, court clerks, and bailiffs.

Since teams are unaware of which side of the case they will present until shortly before the competition begins, they must prepare for both the prosecution and defense. All teams must present both sides at least once.

The phrase, "beauty is in the eye of the beholder," points out the differences that exist in human perceptions. That same subjective quality is present in the scoring of the mock trial. Even with rules and evaluation criteria for guidance, as in real life, not all scorers evaluate a performance identically. While we do everything possible to ensure consistency in scoring, the competition reflects this quality that is a part of all human institutions, including legal proceedings.

II. Program Objectives

For the **students**, the mock trial competition will:

1. Increase proficiency in basic skills such as reading, speaking, critical thinking skills such as analyzing and reasoning, and interpersonal skills such as listening and cooperating.

2. Provide the opportunity for interaction with positive adult role models in the legal community.

3. Provide a hands-on experience outside the classroom from which students can learn about law, society, and themselves.

For the **school**, the competition will:

2. Promote cooperation and healthy academic competition among students of various abilities and interests.

2. Demonstrate the achievements of high school students to the community.

3. Provide a challenging and rewarding experience for participating teachers.

III. Code of Ethical Conduct

At the first meeting of the Mock Trial Team, this code should be read and discussed by students and their teacher. **The Code of Ethical Conduct governs participants, observers, guests and parents** at all mock trial events**.**

All participants in the Mock Trial Competition must adhere to the same high standards of scholarship that are expected of students in their academic performance. Plagiarism of any kind is unacceptable. Students' written and oral work must be their own.

Coaches, non-performing team members, observers, guests, and parents shall not talk to, signal, communicate with or coach any member of the currently performing side of their team during trial. This rule remains in force during any recess time that is called by the judge. Currently performing team members may, among themselves, communicate during the trial; however, no disruptive communication is allowed. Non-team members, teachers and coaches must remain outside the bar in the spectator section of the courtroom.

Team members, alternates, attorney coaches, teacher coaches and any other persons directly associated with the Mock Trial team's preparation are not allowed to view other teams in competition so long as they remain in the competition themselves.

Students promise to compete with the highest standards of deportment, showing respect for their fellow students, opponents, judges, evaluators, attorney coaches, teacher coaches, and mock trial personnel. All competitors will focus on accepting defeat and success with dignity and restraint. Trials will be conducted honestly, fairly and with the utmost civility. Students will avoid all tactics they know are wrong or in violation of the rules, including the use of unfair extrapolations. Students will not willfully violate the rules of the competition **in spirit or in practice**.

Teacher coaches agree to focus attention on the educational value of the mock trial competition. They shall discourage willful violations of the rules. Teachers will instruct students as to proper procedure and decorum and will assist their students in understanding and abiding by the competition's rules and this Code of Ethical Conduct.

Attorney coaches agree to uphold the highest standards of the legal profession and will zealously encourage fair play. They will promote conduct and decorum in accordance with the competition's rules and this Code of Ethical Conduct. Attorney coaches are reminded that they are in a position of authority and thus serve as positive role models for the students. All participants are bound by all sections of this Code of Ethical Conduct and agree to abide by the provisions. Teacher and attorney coaches should ensure that students understand and agree to comply with this Code. Violations of this Code may result in disqualification from competition.

Charges of ethical violations involving persons other than the student team members must be made promptly to a trial coordinator who will ask the complaining party to complete a dispute form. The form will be taken to the competition's communication's center, whereupon a panel of mock trial host sponsors will rule on any action to be taken regarding the charge, including notification of the judging panel. Violation occurring during a trial involving students competing in a round will be subject to the dispute process described in the Rules of the Competition.

IV. THE CASE:
ANDY PARKER, et al. V. PARADISE COUNTY SCHOOL DISTRICT

Introduction and Stipulated Facts

In March 2003, the plaintiffs' 13-year-old child, Andy Parker, was seriously injured when his/her homework project, a simulated volcano, exploded. The child's right hand received severe lacerations and one finger was almost destroyed. Corrective and plastic surgery was required to restore the hand to its present functioning level of 80%.

The science teacher, Pat Mentor, asked the students in Andy's class to prepare projects for demonstration on Science Day, March 10. Andy chose to build a simulated volcano. The volcano was constructed at Andy's home, with the help of his/her father/mother and older brother. The powder used to create the "eruption" effect was taken from firecrackers purchased by Andy's parent. As it happens, several other students also brought volcano projects for demonstration on Science Day, and all three volcanoes were stored in a closet in the teacher's classroom. One of these volcanoes was brought out and demonstrated.

The next day, Andy picked up his/her volcano as instructed to take it home. While waiting for the school bus, Andy decided to demonstrate the volcano for the other students. He/she gave one or two demonstrations, and was pouring powder for a second or third demonstration. A spark apparently entered the plastic bottle containing the remainder of the powder and some fuses, causing the explosion.

All the witnesses in this case have personal knowledge of all the exhibits.

On behalf of their minor child, Andy's parents have brought this action against the school board for negligence due to the science teacher's lack of proper supervision in allowing Andy to build and to demonstrate a volcano with firecracker powder.

Witnesses

For the Plaintiffs:

Andy Parker, a 13-year-old in 6th grade at the time the injury occurred,
Johnny/Jonni Parker, Andy's parent,
Marty Watkins, a classmate of Andy's.

For the Defense:

Pat Mentor, science teacher at Paradise County Middle School,
Sandy Todd, another teacher at Paradise County Middle School,
Alex Grainger, another classmate of Andy's.

Issues

(1) Was the science teacher, Pat Mentor, negligent in allowing a 13-year-old child to build and to demonstrate a simulated volcano? (Assume the school board is liable under the doctrine of respondeat superior if the teacher was negligent.)

(2) Was the child comparatively negligent in intentionally exposing him /herself to obvious danger? Did the child assume the risk of this activity? Were the parent's actions negligent?

Note: Bus and after-school supervision is **not** an issue in this case.

AFFIDAVIT of ANDY PARKER

My name is Andy Parker. I go to Paradise County Middle School.

When my science teacher, Mr./Ms. Mentor, asked the class to think up projects to show off for our parents on Science Day, I decided to make a real working model of a volcano. I really liked the classes where we learned about Mount Vesuvius and Pompeii, and all the strange things they found when they dug out the old city; you know, the way the people were found frozen in positions like they didn't realize what was happening to them, and all the destruction caused by the hot lava.

Anyway, my brother had done a volcano for his science project a couple of years ago, and it was neat the way the thing exploded. They wouldn't let me get near it back then, but I knew I could get my mom/dad and my brother Michael to help me build it, now that I was a little older.

I did what my mom/dad told me to do. I found a large jar, and a heavy piece of board. I covered the board with aluminum foil, and put the jar in the middle. Then Michael and I used some clay and mud Michael had mixed up, and shaped it into a cone around the bottle, with a big crater-like dip at the top for the opening. We put a small metal can, with a wire attached to the top of the volcano so I could pull it out when I wanted to, in the bottom of the bottle. We tried it out on the floor of the garage.

Oh, yeah, we also used firecracker powder from firecrackers my mom/dad bought. Mom/Dad told me to put enough powder into the can to cover the bottom of it, then to lower it into the bottle. The first time we tried it out, Michael threw in the match to start the explosion. Then he/she let me try it while he/she and Michael watched. Once I got a match lit (I broke one), I threw it in the center just like Michael did. Boy, did it work great!

Mom/Dad put the powder in an aspirin bottle, and he/she told me to keep it away from anything hot because it might catch fire accidentally. He/she also said I should be real careful when demonstrating the volcano because I could get hurt. On the day before Science Day, I asked mom/dad to give me some matches to take to school as a part of my volcano project, but he/she said no, that I could get matches from my teacher. I told him/her that I would be careful, but he/she just said no.

I put the volcano in Mr./Ms. Mentor's closet when I took it to school that day, and I was really disappointed to see that there were two other kids who had brought volcanoes. They looked a little different from mine, though. One was made out of white stuff, and the other one wasn't shaped as well as mine.

When it came time to demonstrate the volcano projects, they chose to use mine, I guess because it looked more realistic than the others. Mr./Ms. Mentor wouldn't let me demonstrate it though, and when he/she demonstrated it, he/she lit the match to a string running into the center of the volcano instead of throwing the match in the way mom/dad taught me. It took a little longer to work that way, but the end result was the same: KABOOM!

The next day, I picked up my volcano project to take it home. The bottle with the powder in it looked different, somehow bigger, than the one I brought to school. There were a couple of stiff string-like things inside, but the powder still looked the same. All of the other projects had been picked up, and there were no other aspirin bottles laying around.

As I waited for the bus, several kids told me they wanted to see it work. I refused at first, and I ran across the street to the drugstore to buy a pack of chewing gum. I know it's against school rules to go across the street, but all the kids do it. After I came back, they told me they didn't think I could

make it work, so I said okay. At the time, I thought it was real lucky that Mr./Ms. Mentor left the book of matches with my project, cause otherwise I wouldn't have been able to do it.

I thought there was a school rule against having matches on school grounds, but since we had used them to demonstrate the project yesterday I thought the rule was meant to stop kids from starting fires on purpose. I remembered what mom/dad told me about being real careful with matches near the powder, and I thought I was doing it right.

I put some powder from the aspirin bottle in the can and put the bottle aside while I lit a match and threw it in. It worked, and I felt real proud. Some more kids heard the explosion and came running, and they asked me to do it again, so I did. The third time, I had just started putting powder in the can when the aspirin bottle just exploded in my right hand. I never felt so much pain before in my life, even when I had a tooth pulled at the dentist. One of the kids found a teacher who took me to a hospital and called my dad/mom.

The doctor says my hand will never be the same again.

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ANDY PARKER

AFFIDAVIT of JOHNNY/JONNI PARKER

My name is Jonathan/Johanna Parker. Andy Parker is my child. I have one other child, an older son named Michael. I am divorced.

When Andy came home from school one day in February, he/she said that the science teacher had told the class to come up with projects to show all the parents on Science Day on March 10. Andy said the teacher had okayed a volcano project; Andy wanted to build one just like Michael had done two years before.

Andy is an average student. He/she has never been very good in reading or writing; as a matter of fact he/she flunked third grade. I think a lot of his/her problem was that my ex-wife/husband never got Andy up in time for school the way he/she should have. But for the first time in a long time, Andy was excited about a school project, and even though I was concerned about the danger involved, I thought it was okay if the teacher had approved it. Besides, I had learned with Michael how to do this kind of thing safely.

I told him/her what to do, and I bought some firecrackers for the powder. I was afraid of combustion, so I didn't want Andy to use the fuses from the firecrackers plus I was with them when we took the firecrackers apart. We laid them out on the garage floor and removed the powder very carefully. I was watching the whole time. Then we put the powder in an empty aspirin bottle and put a plastic cap on it. I got rid of the fuses and the other remains of the firecrackers.

I showed Andy how to light the volcano safely, by throwing the match into the center and pulling his/her hand away fast. I told him/her not to let the match get close to the powder while he/she was still holding onto the match. I warned about combustion and how he/she could get hurt if he/she wasn't careful. We even did a couple of trial runs with the volcano at home and it worked perfectly.

I didn't expect Andy to be demonstrating the project without adult supervision. I didn't even give him/her a set of matches. I assumed he/she would be supervised at school just as I supervised him/her at home.

When the teacher called and told me something had happened to Andy, and that they had taken my child to the hospital, it never occurred to me that it had anything to do with the volcano. I had given strict instructions about it and, even though Andy may be a little mischievous now and then, he/she obeys me.

The doctor said Andy received several severe lacerations, and one finger was almost destroyed. When I think about the pain he/she must have suffered, it breaks my heart. He/she is just a kid and will never have the full use of his/her hand again. The doctor says it will never get better than it is right now, about 80% functioning level. The corrective and plastic surgery helped, but it sure cost us a pretty penny. It doesn't matter, though; I'd pay anything to make this whole nightmare go away.

I just can't believe the school would let this sort of thing happen.

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JOHNNY/JONNI PARKER

AFFIDAVIT of MARTY WATKINS

My name is Marty Watkins. I went to sixth grade at Paradise Middle School with Andy Parker. I turned 13 years old last January.

Andy's a lot of fun -- always doing something funny, getting into trouble, like the time he/she drew a picture of Mr./Ms. Mentor on the drawing board when the teacher stepped out for a minute; the teacher didn't see it until we started laughing so hard he/she couldn't help but wonder what was so funny. Andy didn't mean any harm; he/she never does. I guess he/she just likes to get everyone's attention. We all know he/she is older than the rest of us.

While we were waiting for the school bus to take us home, some of the kids asked Andy to show them his/her volcano. At first, he/she said no. But then he/she ran across the street and went into the drugstore for a few minutes. When he/she came out, he/she had a small package. The other kids started in again, asking him/her to demonstrate the volcano. This time Andy said yes.

Andy told everyone to stand back, and he/she put some powder in the can in the center of the volcano. Andy used a set of matches; he/she said they were just playing with the project when he/she picked it up from Mr./Ms. Mentor. I didn't see where the matches came from; at least, I just don't remember clearly. But I believe Andy over that jerk Alex. Alex was finally caught cheating last year and was suspended for two weeks.

Andy threw a lighted match into the center of the volcano, and almost immediately there was a big bang with sparks coming out of the top of the volcano. More kids came around, I guess because of the sound, so Andy agreed to do it again. Andy told me that his/her mom/dad told him/her that if a spark got into the powder, it could explode, so he/she had to be careful.

The third time Andy tried to demonstrate the volcano, the bottle with the powder just exploded in his/her hand, for no reason at all that I could see. One thing I thought was strange, though: Andy

said that his/her mom/dad wouldn't let him/her use a fuse the way the science teacher did on Science Day, but I could see a couple of firecracker fuses in the aspirin bottle along with the powder. I don't know whether Andy realized that or not, but I am sure the fuses were there.

I really thought Andy knew what he/she was doing, being older than the rest of us. I just don't understand how it happened.

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MARTY WATKINS

AFFIDAVIT of PAT MENTOR

My name is Pat Mentor. I teach science to sixth graders Paradise Middle School. I teach only science, taking over from the regular teachers for that subject at specific times during the day. This is a special program initiated by the school board to focus on certain subjects, such as science and math, taught by teachers with superior education and experience.

I earned my bachelor of science and master's degree in education (summa cum laude) from UCLA. After two years' experience teaching high school science, I decided to further my education. I received a full scholarship at the Massachusetts Institute of Technology, where I earned a Ph.D. Although I was offered a lucrative position at a major pharmaceutical company, I accepted this job because teaching has always been my first love. There's nothing quite as rewarding as seeing a child's eyes open wide when I show him or her the magic of science . . . but I digress.

I suppose an accident of this nature was bound to happen someday because children at this age tend to be a little careless. But I cannot believe I am being blamed. Kids are so fascinated by the concept of combustion that I constantly warn them of the dangers of being careless.

About the time we started teaching the subject of "Earth Surfaces," I told the students to prepare projects for the upcoming Science Day, last March 10th. Andy Parker, the class "cut-up," told me he/she was going to make the best volcano we had ever seen. It was encouraging to see a goof-off such as Andy finally taking an interest in something.

Several kids chose to make volcanoes, although I never suggested volcanoes as a project. As with anyone using even slightly dangerous products, I gave them oral and written warnings (see Safety Rules). I told them never to demonstrate their projects without me or a parent watching, and I warned them that they should never use matches or lighters even near any of the chemicals and powders they would be using.

Knowing Andy's playful nature, I said that I didn't want him/her to do this project if he/she couldn't obey the safety rules. We talked in general terms about matches and fire, but I don't recall exactly what was said.

The written warnings also give strict instructions that the kids should not light a fire without using a paper-extender or a string-like fuse. I don't understand why Mr./Ms. Parker thinks that fuses are more dangerous than throwing matches; that just doesn't make sense.

Now, I did offer an alternative way of making a volcano -- with a chemical compound and plaster of Paris. I made a special point of suggesting this type of volcano to Andy but, of course, that sort of volcano doesn't create the loud explosion and sparks that a firecracker powder volcano makes. One student did choose to make the safer version.

When I demonstrated Andy's volcano for Science Day, I used fuses from one of the other kids' projects. I may have put a few fuses in the bottle with the powder, since I was asked to demonstrate it several times and was expecting to be asked again. Of course, I would not allow the kids to demonstrate it; I kept a fire extinguisher nearby (just in case) even when I was demonstrating.

Know this: I would never have left any matches with any of the kids' projects when they picked them up to take home. I lock all matches and other dangerous items in a drawer in my desk when I am out of the room. I am a very careful, tidy person.

I am sorry for what happened to Andy Parker, but it was his/her own fault. I did my job, and my responsibility ends at the classroom door.

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PAT MENTOR

AFFIDAVIT of SANDY TODD

My name is Sandy Socrates Todd. I teach sixth grade at Paradise County Middle School, and Andy Parker was my student when this terrible accident happened.

Pat Mentor comes into my class four times a week to teach science. I have regular meetings with Pat and the visiting math teacher to evaluate students' progress and to discuss problems.

It's a strange coincidence that we had been talking about Andy Parker a few weeks before the accident. Andy is a bit of a pain in the neck, if you know what I mean. Maybe it's partly because his/her parents are divorced; I don't really know. I told Pat to pay extra careful attention to that kid, not to expect him/her to obey orders. We discussed the fact that Andy failed a grade and that insecurity might be at the root of his/her problems. I remember that we both thought he/she had a good mind, if only he/she could direct his/her energies towards something positive.

I am a little surprised, to be honest, that Pat allowed Andy to create such an inherently dangerous project as a volcano. I am not sure I would have approved of it had I known about it. But, you must remember, Pat is the teacher when it comes to science, and if this, or anything for that matter, would spark Andy's interest in school, then it would be the right thing to do. After all, our primary concern is that these young people take an interest in learning, for their own sakes.

Pat Mentor is extremely well-qualified, and he/she really seems to care about these young minds. I don't believe he/she has worked with kids this age very much; most of his/her experience is at a higher education level, but Pat is learning fast what you can or cannot expect out of sixth-grade kids. I am working very closely with Pat at the request of the Principal.

The school has published safety rules. I gave copies to Pat to hand out to the class, and I am sure that he/she discussed the rules with the class. I also discussed these rules with every class at the

beginning of the school year, so I know Andy Parker was aware of the rule against demonstrating projects without an adult present.

There is one thing that's for sure: Andy Parker violated the school rule prohibiting students from crossing the street. Every student has that rule drilled into his/her head from first grade onward, since it is such a busy street and children have been hit by passing cars before.

Marty Watkins is the ideal student: good grades, good manners, and good grooming. Alex Grainger? Well, Alex has gotten into some trouble over the years, but he/she is a good kid at heart.

By the way, I was on bus guard duty that day. I heard some commotion where some kids were gathering, and I was on my way to investigate what sounded like an explosion when Marty Watkins came running to tell me about the accident. The school board has investigated the incident and has already cleared me of any responsibility. I guess that's why I am not a party to this lawsuit, and why bus guard duty is not even an issue in this case. With so many kids, there's no way to watch them all.

In my twenty years of teaching, this is the first time anything so serious as this has happened to one of my students.

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SANDY S. TODD

AFFIDAVIT of ALEX GRAINGER

I am Alex Grainger. I go to Paradise Middle School with Andy Parker -- last year, too.

Everyone knows Andy Parker failed a grade; that's why he/she is over a year older than the rest of us. He/She thinks he/she is so righteous, just because he/she is older. Well. What I mean is that Parker acts like a clown all the time. I'm not surprised Parker finally hurt him/herself; it was about time, seeing how Parker is so dense.

I watched Mr./Ms. Mentor demonstrate the volcano on Science Day. It's just like Mr./Ms. Mentor says. He/She got some fuses from another kid's project, I don't know whose, and used them in Parker's volcano to do the demonstrations.

I don't know what he/she did with the fuses after the demonstrations, but I do know about the matches. I watched Mr./Ms. Mentor unlock his/her desk drawer and pull out a book of matches the morning of Science Day, and I helped him/her clean up after the parents left for the day. You see, I got into a little trouble last year and I was on clean-up detail for weeks. Anyway, I saw Mr./Ms. Mentor lock the matches and some of that permanent glue-stuff in his/her desk drawer later that day.

The day after Science Day, while we were waiting for the bus, Parker walked around bragging that his/her volcano had been the best Science Day project the school had ever had. What a clown. Besides, who cares? I told Parker to shut up. I guess he/she thought I was challenging him/her or something, because Parker ran across the street and came back a few minutes later with a package from the drugstore.

He/She pulled out a book of matches from the drugstore package and starting making out like he/she was a magician or something, waving his/her hands around and talking with a strange accent.

He/She drew a crowd around after a while and actually lit a match to throw into that stupid clump of clay.

I yelled at Parker when I saw the matches, but he/she said he/she knew what to do and how to do it and that I should mind my own business. Well, I'm not going to stick my neck out for a clown, so I just did what he/she said, I minded my own business.

I watched Parker pour some powder from a little bottle into the center of his/her "volcano". He/She was messing with something in the powder, maybe the fuses, and just tossed whatever it was aside. Then he/she pretended to make a big show out of throwing the match into the thing. The best part of the show was Parker trying to strike a match -- he/she must have broken three or four matches before he/she got one lit.

If you had seen the way Parker was acting, talking with a lighted match in his/her hand, then making a big deal out of throwing it into the center of his "volcano," you wouldn't have any trouble understanding how he/she blew up his own hand. If you ask me, he/she got what he/she deserved.

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ALEX GRAINGER

Rule 1

At no time may students use or possess matches, firecrackers, or any type of explosives without the permission of a teacher and in the presence of that teacher.

Also remember:

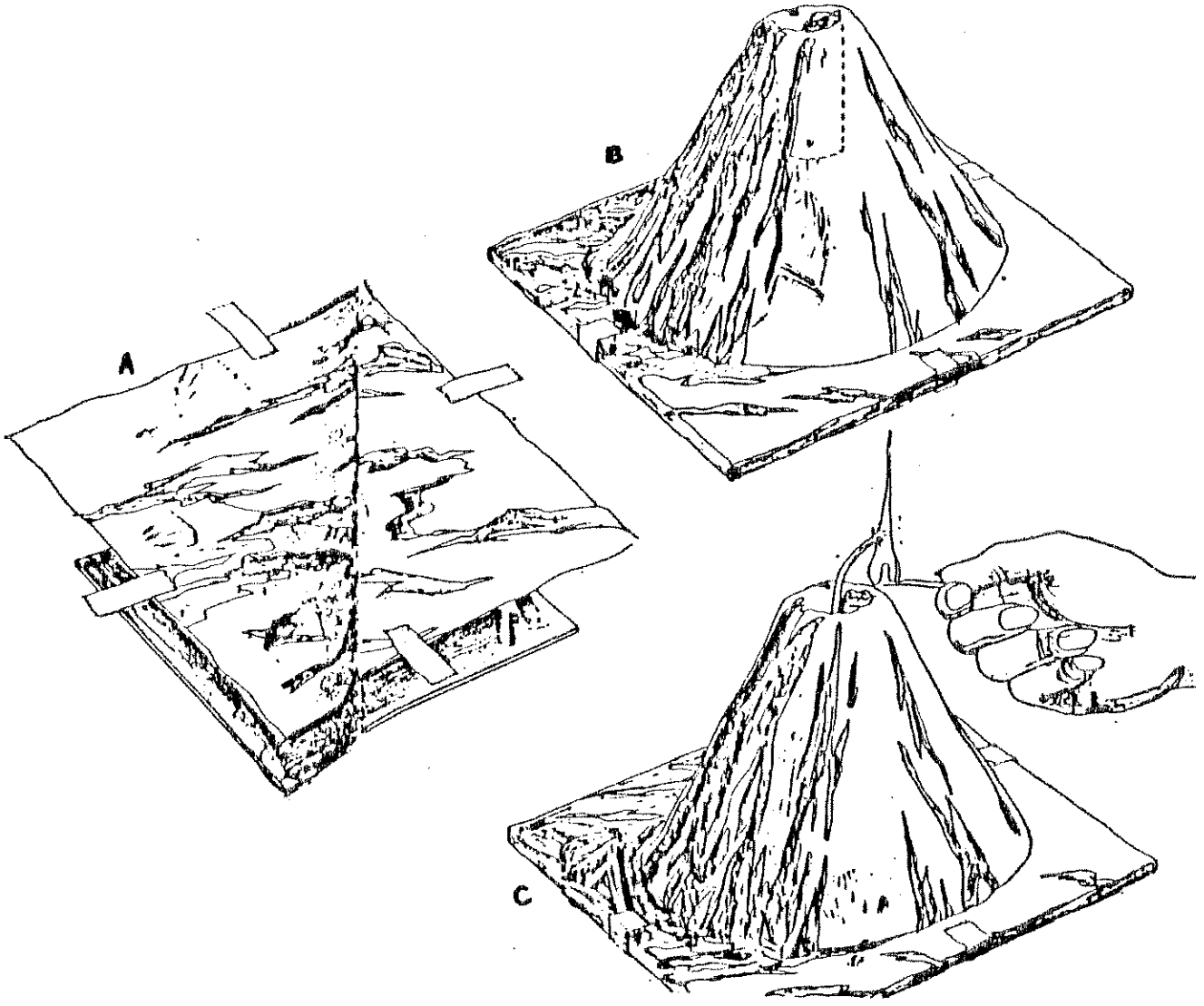
1. Experiments that involve flames, sparks, etc., should be done far enough from the audience to avoid accidents.
2. When experiment using or producing fire are involved, be sure to have handy a carbon dioxide fire extinguisher. Hardware stores have inexpensive fire extinguishers of this type available. Be sure that the table is covered with flame-retardant material.
3. Always read cautions accompanying the chemicals and any special handling instructions on the label. Never allow the hands or any part of the body to come in contact with the chemicals being used. Good laboratory technique for handling chemicals includes the use of spatulas, tongs, measuring spoons, graduates, stirring rods, etc.
4. If you doubt your ability to perform the experiment, ALWAYS check first with your teacher or with a qualified individual trained in chemistry such as your local pharmacist, science club director, etc.
5. When noxious gases and odors form, be sure that adequate ventilation is available -- or eliminate the experiment from your program.
6. Again, any experiment can be dangerous if not carried out as directed.

Fireworks demonstrations should be attempted only under the supervision of a qualified person, preferably a chemistry teacher. Before any fireworks are ignited, state and local laws governing fireworks should be read, understood, and complied with. FIREWORKS DISPLAYS SHOULD BE MANUFACTURED OR SET OFF ONLY IN ACCORDANCE WITH THESE LAWS. Also:

1. All fireworks displays should be ignited outdoors away from all buildings, trees, and bushes. A bucket of dry sand should be available to put out any accidental fires. NEVER USE WATER ON THESE FIRES!
2. Never put and ignite any fireworks mixture in a closed container. This may result in a severe explosion.
3. All ingredients should be dry and finely powdered. Use a glass mortar and pestle for powdering chemicals. Powder only small amounts at any one time. Powder each ingredient separately. When possible, purchase the necessary ingredients already powdered.
4. When measuring the amounts of chemicals to be used in a formula, parts by weight refers to any standard amount. It can be grains, grams, teaspoonfuls, etc. To illustrate, 4 parts by weight means 4 grams (or whatever unit of measure is being used); 1 part by weight means 1 gram, 2 parts by weight means 2 grams; etc.
5. Powders should be mixed by placing them on a sheet of paper which is gently tilted back and forth. Never mix them using a spatula or by grinding with a mortar and pestle. Using any form of pressure may result in an accidental explosion.
6. Always use the least amount of powder necessary to produce an effective display.
7. Never use a match, candle, or other exposed flame to ignite these mixtures. The use of prepared touch paper or string as explained in the first experiment below is recommended
8. To avoid accidents, these mixtures should be prepared just prior to use. Never store these mixtures for later use.

Activity 23 Making a Volcano

Source: Earth Science by T.M. Brown and Grace H. Kemper (Morristown, N.J.: Silver Burdett Co., 1979)



PURPOSE

To simulate a volcano; to observe what happens when a volcano erupts

MATERIALS

Plaster of Paris	Matches
Ammonium dichromate	Aluminum foil
Strip of magnesium tape	Stiff board
Safety goggles	Masking tape

DO THIS

A. Tape the sheet of aluminum foil to the board as shown.

B. On the board, shape a volcanic cone with a good-sized crater from plaster of Paris. Let your plaster of Paris model harden for about a week before going on to step C

C. To make a volcano, fill the crater with ammonium dichromate. Into the top of this, put a strip of magnesium tape to act as a fuse.

D. It is very important that you put on safety goggles before going on to the next step. If someone is assisting you, that person should also wear safety goggles.

E. Have your teacher light the fuse. When it is burning well, step back. The chromic oxide that is formed represents the tephra thrown out by a real volcano.

REPORT

1. Sketch a diagram showing what the volcano looks like.

2. Does your sketch look like any of the craters shown in this chapter? If so, describe how these craters were formed.

Source: Magic With Chemistry by Edward L. Palden (New York: Grosset & Dunlap)

A MINIATURE VOLCANO

Effect: A tube containing a fuse inserted in one end is placed into the ground. When ignited, the fuse burns and lights the mixture, which burns with many changes of color, producing an eruption of bright lights and sparks similar to an active volcano.

Materials: As described in What To Do.

What To Do: Mix together the following chemicals, using only the amounts stated.

IGNITING MIXTURE

Potassium nitrate	15 parts by weight
Powdered sulfur	2½ parts by weight
Charcoal	2½ parts by weight

GREEN FIRE MIXTURE

Barium nitrate	7 parts by weight
Powdered sulfur	4 parts by weight
Charcoal	1 part by weight
Potassium nitrate	1 part by weight

RED FIRE MIXTURE

Strontium nitrate	11 parts by weight
Powdered sulfur	4 parts by weight
Charcoal	1 part by weight
Calcium carbonate	11 parts by weight
Potassium nitrate	1 part by weight

Using plaster of Paris, mold it around a cardboard tube and also plug the bottom. Allow it to dry and then place alternating layers of the green and red fire mixtures in the tube. The top (last) layer should be the igniting mixture. Place the tube in the ground, insert the fuse and ignite. Use a fuse long enough to allow you to retire to a safe distance before the powders begin to burn. This particular type of pyrotechnic display is very effective at night.

What Happens: The fuse lights the igniting mixture, which sets off the other mixtures, producing the colored flames.

A VOLCANIC SPRAY

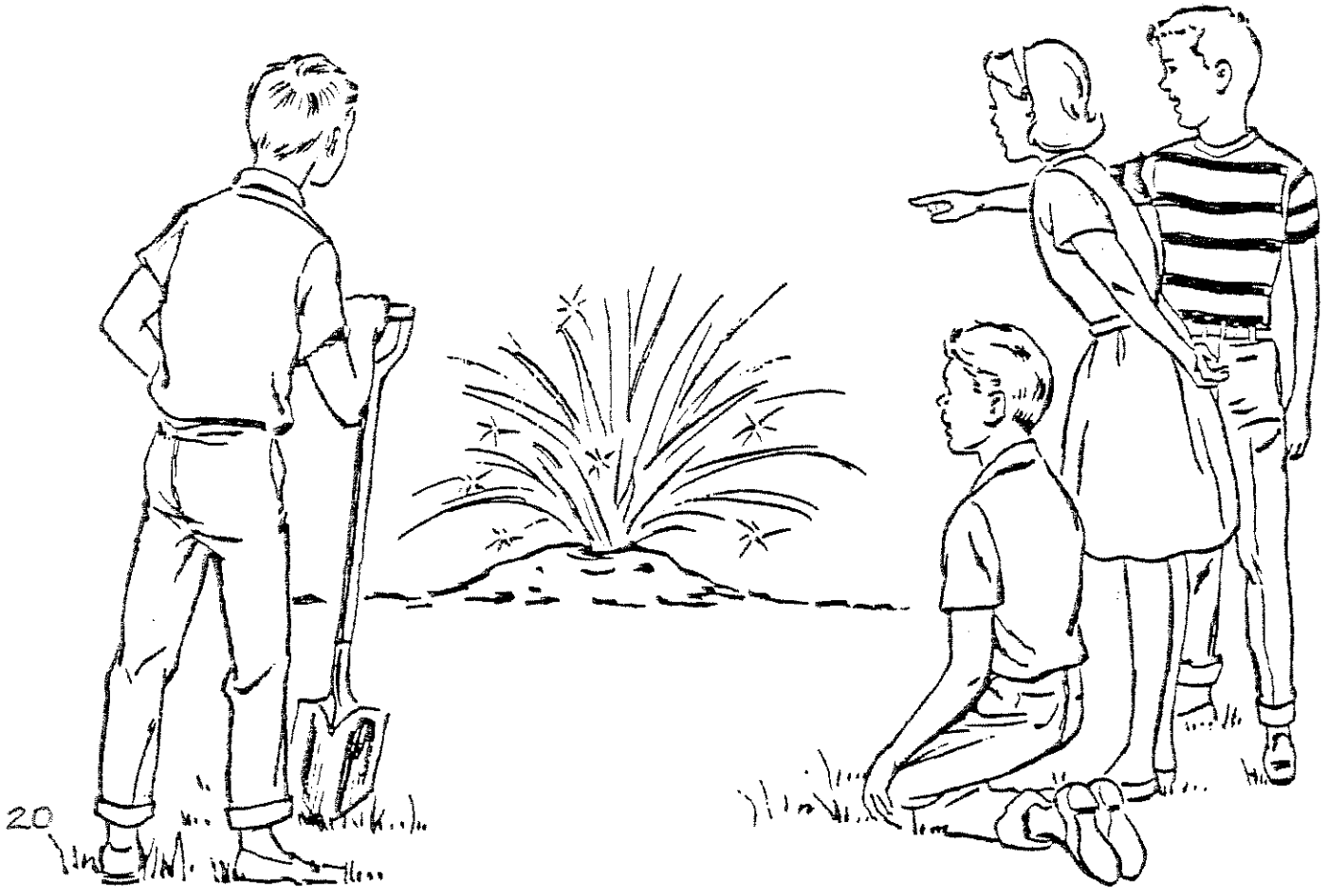
Effect: Lighting a fuse inserted into a mixture of chemicals produces an eruption of fire, smoke, and sparks that suggests a very active volcano. This experiment is best done at night.

Materials: The following mixture made by carefully mixing on a sheet of paper:

Potassium nitrate	2 parts by weight
Powdered magnesium metal	1 part by weight
Powdered zinc metal	1 part by weight
Powdered iron	1 part by weight
Powdered charcoal	1 part by weight
Powdered sulfur	1 part by weight

What To Do: Obtain an iron crucible which has a hole in its base. A flower pot can be used, but it must be placed in the ground and thoroughly surrounded by earth, as shown in the illustration. Prepare the mixture of chemicals. DO NOT INCREASE OR DECREASE THE AMOUNTS STATED. Place the mixture in the container and cover with a sheet of aluminum foil. This will prevent the chemicals from spilling when the container is inverted (turned upside down). If the iron crucible is used, place it on a sheet of asbestos board. If you are using the flower pot, follow the directions already given. Insert a fuse and ignite it. Step back a safe distance to avoid the fiery spray and sparks that erupt.

What Happens: The mixture is confined in an enclosed container with only a small hole for the gases that are produced to escape. The pressure that develops forces the gases to escape through the hole, carrying along the burning magnesium, zinc, and iron metals as fiery sparks that shoot many feet into the air.



A CHEMICAL VOLCANO

Effect: A model of a volcano suddenly becomes active and black "lava" streams down its slopes.

Materials: A plaster of Paris volcano (see illustration for method of construction); dry ice; water; liquid detergent.

What To Do: Pour enough water through the top of the volcano so the can inside is one-half full. Because some liquid detergents are more concentrated than others, a little experimenting may be necessary to find the right amount. Anywhere from one-fourth to one teaspoonful will be needed. It is recommended that you start with the smaller amount first, increasing it gradually until satisfactory results are obtained. After adding the detergent to the water, drop in a small piece of dry ice. The volcano will start to foam and "lava" will stream down the sides as it is forced out of the top.

What Happens: You are already familiar with the reaction of dry ice in water. The churning of the water as the dry ice melts causes the detergent to foam (suds) and the pressure of the carbon dioxide gas forces the suds out the top, much like a typical volcano.

A Variation: Before adding the detergent or dry ice, add a few drops of black vegetable dye, then continue as explained above. The "lava" will be colored black and look more realistic.