

Completing ADI in an Online Environment

Welcome

This spreadsheet is intended to show some options for completing the labs published in our books in a virtual teaching environment.

Students completing the ADI process together in person is best, but when that is not possible many of the labs can be completed at home, either through a substitution of materials, providing them with some of the data that they can then analyze, or using readily available materials.

Overview of this Spreadsheet

Not all students will have access to materials that you might consider "readily available", so be sure to check before jumping in on the lab. If you can get at least one student per group to have the materials they can broadcast the tests to the rest of their team.

Safety is still a major concern, even with simple labs. Be sure to check students procedures to make sure they are taking necessary precautions.

Databases and other resources mentioned in the books can be found at <https://www.nsta.org/publications/press/extras/>

Color Coding

Green means the lab can be conducted with minimal changes and should work for most students/settings

Yellow means the lab might work for some students and settings, but would require certain computer types or changes to the question/task.

Orange means the lab requires a hands-on component that most students would not be able to safely replicate at home.

More ideas:

If you have thoughts about how a lab could be shifted into an online environment that we have missed, please email them to

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3rd Grade

Lab	Topic	GQ	Ideas for online
1	Magnetic Attraction	What types of objects are attracted to a magnet?	Have students use a magnet to identify magnetic and nonmagnetic things in their house and then bring the data to the group to make the board.
2	Magnetic Forces	How does changing the distance between two magnets affect magnetic force strength?	Not Recommended
3	Changes in Motion	Where will the marble be located each time it changes direction in a half pipe?	Use Phet Skatepark with friction on: http://phet.colorado.edu/sims/html/energy-skate-park-basics/latest/energy-skate-park-basics_en.html
4	Balanced and Unbalanced Forces	How do balanced and unbalanced forces acting on an object affect the motion of that object?	Use Phet Forces and Motion "Net Force" https://phet.colorado.edu/sims/html/forces-and-motion-basics/latest/forces-and-motion-basics_en.html
5	Life Cycles	How are the life cycles of living things similar and how are they different?	Show pictures of life cycles
6	Life in Groups	Why do wolves live in groups?	Already online (videos)
7	Variation within a Species	How similar are earthworms to each other?	Show them pictures or video of earthworms
8	Inheritance of Traits	How similar are offspring to their parents?	Show pictures of families
9	Traits and the Environment	How do differences in soil quality affect the traits of a plant?	Not Recommended

3rd Grade

10	Fossils	What was the ecosystem at Darmstadt like 49 million years ago	Show pictures of fossils
11	Differences in Traits	How does fur color affect the likelihood that a rabbit will survive?	Phet simulation, but not HTML5 so students need a PC or Mac. Chromebook probably won't run it.
12	Adaptations	Why do mammals that live in the arctic ocean have a thick layer of blubber under their skin?	Not Recommended
13	Weather Patterns	What weather conditions can we expect here during each season?	Already online
14	Climate and Location	How does the climate change as one moves from the equator toward the poles?	Already online

4th Grade

Lab	Topic	GQ	Ideas for online
1	Energy of Motion	How does changing the speed of a marble affect the energy of that marble?	Not recommended
2	Energy Transfer through Collisions	How does the energy of a moving ball change after it collides with objects that have different masses?	Not recommended
3	Energy Transfer between liquids	How can we predict how much the temperature of 100 ml of water will change when we add different amounts of hot water to it?	Not recommended
4	Energy transfer by light?	How does the distance between a light source and an object affect the amount of energy an object receives from the light source?	Not recommended
5	Electric Currents	How does adding more batteries or bulbs to a closed circuit affect the brightness of a single bulb within that circuit?	There is a PHET lab on circuits, but it would be difficult to get any qualitative data. They could maybe measure the length of the lines coming off the lightbulb. https://phet.colorado.edu/en/simulation/circuit-construction-kit-dc
6	Energy transfer by electric currents	How can we make an electric car move faster?	Not recommended

4th Grade

7	Production of waves	How does changing the mass on an object that is dropped into water affect the height of the resulting wave and the position of a floating toy boat?	Some students might have the materials to test this at home. Alternately, you could gather the materials yourself, have the students design the investigation and then you could run/film the tests with them live via video so they could collect the data. You'd need to use a staggered approach for group meetings so that you could be in each group's data collection phase.
8	Characteristics of sound waves	How can we use the properties of waves to explain different sounds	This lab can be completed digitally using a digital oscilloscope and a digital tone generator. See the materials section of the teacher notes in the book for more information.
9	Light and Reflection	What is the relationship between the location of an object and the location of its image in a mirror?	Not recommended
10	Patterns and the transfer of information	How can we use an electric circuit to accurately transfer information about the content of a picture?	Students won't have the materials to create the electric circuit themselves, but they could find ways to try to transmit information to each other through coded messages using video or sound cues.
11	Structures of plants	How does water move from the roots to the leaves of a plant?	Some students might have the materials to test this at home, but it wouldn't be guaranteed.
12	Structures of animals	How should we classify the unknown organisms?	Give them pictures of skulls

4th Grade

13	Information from senses	What type of environmental conditions do mealworms seek out?	Not recommended
14	Movement of water	Why can we see the roots of trees that grow near rivers or streams?	Not recommended
15	Earth's features	Why do large waves often block the entrance to some harbors in New Zealand?	Send out resources digitally (pull from NSTA Press Extras)

Physical Science

Lab	Topic	GQ	Ideas for online
1	Thermal Energy and Matter	What happens at the molecular level when thermal energy is added to a substance?	Not recommended
2	Chemical and Physical Changes	What set of rules should we use to distinguish between chemical and physical changes in matter?	Find videos or record the different reactions for them to look at. Not fully recommended, but could work.
3	Physical Properties of Matter	What are the identities of the unknown substances?	Not recommended
4	Conservation of Mass	How does the total mass of the substances formed as a result of a chemical change compare with the total mass of the original substances?	Not recommended
5	Design Challenge - Cool a Soda	What design will cool a soda the best?	Not recommended
6	Strength of Gravitational Force	How does the gravitational force that exists between two objects relate to their masses and the distance between them?	Phet computer simulation, works on all devices
7	Mass and Free Fall	How does mass affect the amount of time it takes for an object to fall to the ground?	They could use household items (rice or beans in a ziploc)
8	Force and Motion	How does changing the pulling force affect the motion of an object?	Not recommended

Physical Science

9	Mass and Motion	How do changes in the mass of an object affect its motion?	Not recommended
10	Magnetic Force	How is the strength of an electromagnet affected by the number of turns of wire in a coil?	There is a Java based Phet "Magnets and Electromagnets" that *might* work, but won't pull on most devices. Don't recommend
11	Design Challenge - Electromagnet	Which electromagnet design is best for picking up 50 paperclips?	Not recommended
12	Unbalanced Forces	How does surface area influence friction and the motion of an object?	Not recommended
13	Kinetic Energy	How does the mass and velocity of an object affect its kinetic energy?	Not recommended
14	Potential Energy	How can you make an action figure jump higher?	Students might be able to complete with items from home
15	Thermal Energy and Specific Heat	Which material has the greatest specific heat?	Not recommended
16	Electrical Energy and Lightbulbs	How does the arrangement of lightbulbs that are connected to a battery affect the brightness of a single bulb in that circuit?	There is a PHET lab on circuits, but it would be difficult to get any qualitative data.
17	Rate of Energy Transfer	How does the surface area of a substance affect the rate at which thermal energy is transferred from one substance to another?	Not recommended

Physical Science

18	Radiation and Energy Transfer	What color should we paint a building to reduce cooling costs?	Not recommended
19	Wave Properties	How do frequency, amplitude, and wavelength of a transverse wave affect its energy?	Phet Lab, should run on all devices: https://phet.colorado.edu/en/simulation/wave-on-a-string
20	Reflection and Refraction	How can you predict where a ray of light will go when it comes in contact with different types of transparent materials?	Phet Lab, should run on all devices: https://phet.colorado.edu/en/simulation/bending-light
21	Light and Information Transfer	How does the type of material affect the amount of light that is lost when light waves travel down a tube?	Not recommended
22	Design Challenge - Eyeglass Shape	How should eyeglasses be shaped to correct for nearsightedness and farsightedness?	Not recommended

Earth Space Science

Lab	Topic	GQ	Ideas for online
1	Moon Phases	Why does the appearance of the moon change over time in a predictable pattern?	The following simulation isn't a perfect trade-off for hands-on but works decently well. Should pull on all devices, although ipad or bigger is recommended. https://ccnmtl.github.io/astro-simulations/lunar-phase-simulator/
2	Seasons	What causes the differences in average temperature and the changes in day length that we associate with the change in seasons on earth?	The sim in the book won't load on every computer. Check first. If it doesn't work here is an alternate sim: https://sepuplhs.org/middle/iaes/students/simulations/sepup_seasons5.html
3	Gravity and Orbits	How does changing the mass and distance of a satellite and the mass of the object that it revolves around affect the nature of the satellite's orbit?	The updated PHET means the question needs to be tweaked to "How do mass and starting distance of an object and its satellite affect their orbit?" https://phet.colorado.edu/en/simulation/gravity-and-orbits
4	Habitable Worlds	Where should NASA send a probe to look for life?	Send out resources digitally (pull from NSTA Press Extras)
5	Geologic Time and the Fossil Record	Which time intervals in the past 650 million years of Earth's History are associated with the most extinctions and which are associated with the most diversification of life?	Send out resources digitally (pull from NSTA Press Extras)

Earth Space Science

6	Plate Interactions	How is the nature of the geologic activity that is observed near a plate boundary related to the type of plate interaction that occurs at that boundary	Already virtual (websites)
7	Formation of Geologic Features	How can we explain the growth of the Hawaiian archipelago over the past 100 million years?	Send out resources digitally (pull from NSTA Press Extras)
8	Surface Erosion by Wind	Why do changes in wind speed, wind duration, and soil moisture affect the amount of soil that will be lost due to wind erosion?	not recommended
9	Sediment Transport by Water	How do changes in stream flow affect the size and shape of a river delta?	not recommended
10	Deposition of Sediments	How can we explain the deposition of sediments in water?	not recommended
11	Soil Texture and Soil Water Permeability	How does soil texture affect soil water permeability?	not recommended
12	Cycling of Water on Earth	Why do the temperature and the surface area to volume ratio of a sample of water affect its rate of evaporation?	Students may be able to complete at home with available materials. Would need to figure out how to still have this be team work
13	Characteristics of Minerals	What are the identities of the unknown minerals?	not recommended

Earth Space Science

14	Distribution of Natural Resources	Which proposal for a new copper mine maximizes the potential benefits while minimizing the potential costs?	Send out resources digitally (pull from NSTA Press Extras)
15	Air Masses and Weather Conditions	How do the motions and interactions of air masses result in changes in weather conditions?	Send out resources digitally (pull from NSTA Press Extras)
16	Surface Materials and Temperature Changes	How does the nature of the surface material covering a specific location affect heating and cooling rates at that location?	not recommended
17	Factors that Affect Global Temperature	How do cloud cover and greenhouse gas concentration in the atmosphere affect the surface temperature of Earth?	Already virtual but PHET only available as a Java download so may not work on many devices. Okay if kids have PC or Mac
18	Carbon Dioxide Levels in the Atmosphere	How has the concentration of atmospheric carbon dioxide changed over time?	Send out resources digitally (pull from NSTA Press Extras)
19	Differences in Regional Climate	Why do two cities located at the same latitude near a body of water have such different climates?	Already virtual (websites)
20	Predicting Hurricane Strength	How can someone predict changes in hurricane wind speed over time?	Send out resources digitally (pull from NSTA Press Extras) will need to find a way to send a "grayscale" version of hurricane map.

Earth Space Science

21	Forecasting Extreme Weather	When and under what atmospheric conditions are tornadoes likely to develop in the Oklahoma City Area?	Already virtual (websites)
22	Minimizing Carbon Emissions	What type of greenhouse gas emission reduction policy will different regions of the world need to adopt to prevent the average global surface temperature on Earth from increasing by 2C between now and the year 2100	Simulation. Can't be pulled on phones/ipads, but should work on desktop/laptop/chromebook browsers. Check first.
23	Human Use of Natural Resources	Which combination of water use policies will ensure that the Phoenix metropolitan area water supply is sustainable?	Already virtual. Should pull on any device. Link in book is outdated, instead go to: phoenix.watersim.org

Life Science

Lab	Topic	GQ	Ideas for online
1	Cellular Respiration	Do plants use cellular respiration to produce energy?	Not recommended
2	Photosynthesis	Where does photosynthesis take place in plants?	Not recommended
3	Osmosis	How does concentration of salt in water affect the rate of osmosis?	There's an osmosis Gizmo that might work https://www.explorellearning.com/index.cfm?method=cResource.dspDetail&ResourceID=418
4	Cell Structure	What type of cell is on the unknown slides?	Give them pictures of known and unknown cells
5	Temperature and Photosynthesis	How does temperature affect the rate of photosynthesis in plants?	There's a photosynthesis Gizmo that might work https://www.explorellearning.com/index.cfm?method=cResource.dspDetail&ResourceID=395
6	Energy in Food	Which type of nut is best for a new energy bar?	Not recommended
7	Respiratory and Cardiovascular systems	How do activity and physical factors relate to respiratory and cardiovascular fitness?	Give them the people's data instead of having them collect it themselves. Or have them collect data for family members.
8	Memory and Stimuli	How does the way information is presented affect working memory?	They could test on each other virtually
9	Population Growth	What factors limit the size of a population of yeast?	Not recommended

Life Science

10	Predator-Prey Relationships	How is the size of a predator population related to the size of a prey population?	Computer simulation through netlogo. Web based version exists, but may not run on all devices, check first.
11	Food webs and ecosystems	Which member of an ecosystem would affect the food web the most if removed?	Have them use a whiteboarding website or google doc to collaboratively create the foodweb. As a last resort, give them a copy of a complex food web and let them use that to draw conclusions
12	Matter in Ecosystems	How healthy are your local ecosystems?	Not recommended
13	Carbon Cycling	Which carbon cycle process affects atmospheric carbon the most?	Link in book is broken, but sim still works and should be good on any device: https://test-learnermedia.pantheonsite.io/wp-content/interactive/envsci/carbon/carbon.html
14	Variation in Traits	How do beetle traits vary within and across species?	Send out resources digitally (pull from NSTA Press Extras)
15	Mutations in Genes	How do different types of mutations in genes affect the function of an organism?	This works on any device. Phone's formatting is a little awkward (have to scroll around on it) but it does pull up so iPads/all other devices should be good to go.
16	Mechanisms of inheritance	How do fruit flies inherit the sepia eye color trait?	Currently flash, but they're working on an updated version
17	Mechanisms of Evolution	Why does a specific version of a trait become more common in a population over time?	Computer simulation through netlogo. Web based version exists, but may not run on all devices, check first.

Life Science

18	Environmental Change and Evolution	Which mechanism of microevolution caused the beak of the medium ground finch population on Daphne major to increase in size from 1976 to 1978?	Send out resources digitally (pull from NSTA Press Extras)
19	Phylogenetic Trees and the Classification of Fossils	How should biologists classify the <i>Seymouria</i> ?	Find pictures of skeletons to share. One resource: www.ucl.ac.uk/museums-static/obl4he/
20	Descent with modification and embryonic development	Does animal embryonic development support or refute the theory of descent with modification?	Send out resources digitally (pull from NSTA Press Extras)

Biology

Lab	Topic	GQ	Ideas for online
1	Osmosis and Diffusion	Why do the red blood cells appear bigger after being exposed to distilled water?	Not recommended
2	Cell Structure	How should the unknown microscopic organism be classified?	Provide them with pictures of cells
3	Cell Cycle	Do plant and animal cells spend the same proportion of time in each stage of the cell cycle?	Provide them with pictures of cells
4	Normal and Abnormal Cell Division	Which of these patients could have cancer?	Provide them with pictures of cells
5	Photosynthesis	Why do temperature and light intensity affect the rate of photosynthesis in plants?	If your district has Gizmo there is one that might work for this
6	Cellular Respiration	How does the type of food source affect the rate of cellular respiration in yeast?	Not recommended
7	Transpiration	How does leaf surface area affect the movement of water through a plant?	Not recommended
8	Enzymes	How do changes in temperature and pH levels affect enzyme activity?	Not recommended
9	Population Growth	How do changes in the amount and nature of the plant life available in an ecosystem influence herbivore population growth over time?	Netlogo Simulation. Web based version works on some devices, but not all, check first

Biology

10	Predator-Prey Population Size Relationships	Which factors affect the stability of a predator-prey population size relationship?	Netlogo Simulation. Web based version works on some devices, but not all, check first
11	Ecosystems and Biodiversity	How does food web complexity affect the biodiversity of an ecosystem?	Simulation. Should pull on all devices.
12	Explanations for Animal Behavior	Why do great white sharks travel over long distances?	Computer based data analysis, should work well.
13	Environmental Influences on Animal Behavior	How has climate change affected bird migration?	Computer based data analysis, should work well.
14	Interdependence of Organisms	Why is the sport fish population of Lake Grace decreasing in size?	You could make up the data from the water quality test kit for the three locations to give them and then they could determine what information to use/not use.
15	Competition for Resources	How has the spread of the Eurasian collared-dove affected different populations of native bird species?	Computer based data analysis, should work well.
16	Mendelian Genetics	Why are the stem and leaf color traits of the Wisconsin Fast Plant inherited in a predictable pattern?	If your district has Gizmo this simulation has been moved there. https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=1085
17	Chromosomes and Karyotypes	How do two physically healthy parents produce a child with Down syndrome and a second child with cri du chat syndrome?	Provide them with the karyotype digitally. We can send you an option if you need it.

Biology

18	DNA Structure	What is the structure of DNA?	Not recommended. There are some DNA builders out there, but we couldn't find one that was open enough to work for this
19	Meiosis	How does the process of meiosis reduce the number of chromosomes in reproductive cells?	Not recommended. There are some builders out there, but we couldn't find one that was open enough to work for this
20	Inheritance of Blood Type	Are all of Mr J's children his biological offspring?	Provide them with a picture of the results of the blood types and then they can analyze from there.
21	Models of Inheritance	Which model of inheritance best explains how a specific trait is inherited in fruit flies?	Simulation is flash based, so won't pull on many devices
22	Biodiversity and the Fossil Record	How has biodiversity on Earth changed over time?	Send out resources digitally (pull from NSTA Press Extras)
23	Mechanisms of Evolution	Why will the characteristics of a bug population change in different ways in response to different types of predation?	Netlogo Simulation. Web based version works on some devices, but not all, check first
24	Descent with Modification	Does mammalian brain structure support or refute the theory of descent with modification?	Computer based data analysis, should work well.
25	Mechanisms of Speciation	Why does geographic isolation lead to the formation of a new species?	Netlogo Simulation. Web based version works on some devices, but not all, check first
26	Human Evolution	How are humans related to other members of the family Hominidae?	The 3D fossils are currently flash based, but they're working on updating the collection.
27	Whale Evolution	How are whales related to other mammals?	Computer based data analysis, should work well.

Physics, Vol. 1

Lab	Topic	GQ	Ideas for online
1	Acceleration and Velocity	How does the direction of acceleration affect the velocity of an object?	Not recommended
2	Acceleration and Gravity	What is the relationship between the mass of an object and its acceleration during free fall?	Students can most likely complete this lab with materials from home.
3	Projectile Motion	How do changes to the launch angle, the initial velocity, and the mass of a projectile affect its hang time?	There's an HTML5 lab that would work for this: https://phet.colorado.edu/sims/html/projectile-motion/latest/projectile-motion_en.html
4	The Coriolis Effect	How do the direction and rate of rotation of a spinning surface affect the path of an object moving across that surface?	Not recommended
5	Force, Mass and Acceleration	What is the mathematical relationship among the net force exerted on an object, the object's inertial mass, and its acceleration?	Not recommended
6	Forces on a Pulley	How does the mass of the counterweight affect the acceleration of a pulley system?	Not recommended
7	Forces on an Incline	What is the mathematical relationship between the angle of incline and the acceleration of an object down incline?	If using a ball down a ramp instead of the setup suggested in the book, students might be able to complete this with materials at home.

Physics, Vol. 1

8	Friction	Why are some lubricants better than others at reducing the coefficient of friction between metal plates?	Not recommended
9	Falling Objects and Air Resistance	How does the surface area of a parachute affect the force due to air resistance as the object falls toward the ground?	Students can most likely complete this lab with materials from home.
10	Rotational Motion	How do the mass and the distribution of mass in an object affect its rotation?	Not recommended
11	Circular Motion	How does changing the angular velocity of the swinging mass at the top of a whirligig and the amount of mass at the bottom of a whirligig affect the distance from the top of the tube to the swinging mass?	Not recommended
12	Torque and Rotation	How can someone predict the amount of force needed to open a bottle cap?	Not recommended
13	Simple harmonic motion and pendulums	What variables affect the period of a pendulum?	There's an HTML5 lab that would work for this: https://phet.colorado.edu/en/simulation/pendulum-lab
14	Simple Harmonic motion and springs	What is the mathematical model of the simple harmonic motion of a mass hanging from a spring?	https://phet.colorado.edu/en/simulation/masses-and-springs might work
15	Simple harmonic motion and rubber bands	Under what conditions do rubber bands obey Hooke's law?	Not recommended

Physics, Vol. 1

16	Linear momentum and collisions	When two objects collide and stick together, how do the initial velocity and mass of one of the moving objects affect the velocity of the two objects after the collision?	Not recommended
17	Impulse and Momentum	How does changing the magnitude and duration of a force acting on an object affect the momentum of that object?	Not recommended
18	Elastic and inelastic collisions	Which properties of a system are conserved during a collision?	Not recommended
19	Impulse and Materials	Which material is most likely to provide the best protection for a phone that has been dropped?	Not recommended
20	Kinetic and Potential Energy	How can we use the work-energy theorem to explain and predict behavior of a system that consists of a ball, a ramp, and a cup?	Students might be able to complete a very simplified version of this lab using materials from home, but it would be difficult.
21	Conservation of energy and pendulums:	How does placing a nail in the path of a pendulum affect the height of a pendulum swing?	Not recommended
22	Conservation of energy and wind turbines:	How can we maximize the amount of electrical energy that will be generated by a wind turbine based on the design of its blades?	Not recommended
23	Power	Which toy car has the engine with the greatest horsepower?	Not recommended

Chemistry

Lab	Topic	GQ	Ideas for online
1	Bond Character and Molecular Polarity	How Does Atom Electronegativity Affect Bond Character and Molecular Polarity?	PHET Simulation, HTML5 so pulls on all devices.
2	Molecular Shapes	How does the number of substituents around a central atom affect the shape of a molecule?	PHET Simulation, HTML5 so pulls on all devices.
3	Rate of dissolution	Why do the surface area of the solute, the temperature of the solvent and the amount of agitation that occurs when the solute and solvent are mixed affect the rate of dissolution?	Not recommended
4	Molarity	What is the mathematical relationship between the moles of a solute, the volume of the solvent, and the molarity of an aqueous solution?	PHET Simulation, HTML5 so pulls on all devices.
5	Temperature changes due to evaporation	Which of the available substances has the strongest intermolecular forces?	Not recommended
6	Pressure, Temperature, and Volume of Gases	How does changing the volume or temperature of a gas affect the pressure of that gas?	There's an HTML5 PHET for this called "gas properties" that might work.
7	Periodic Trends	Which properties of the elements follow a periodic trend?	This one will work well as it is a data analysis lab.

Chemistry

8	Solutes and the freezing point of water	How does the addition of different types of solutes affect the freezing point of water?	Not recommended
9	Melting and freezing points	Why do substances have specific melting and freezing points?	The "Phase Changes" part of the PHET on States of Matter allows them to change variables like pressure, substance, and temperature to see what happens. It's somewhat less rigorous than the original lab, they wouldn't be able to make and test a prediction, more infer the relationship, and the reading would have to be changed, but in a pinch it would work.
10	Identification of an unknown based on physical properties	What types of solution is the unknown liquid?	Not recommended
11	Atomic structure and electromagnetic radiation	What are the identities of the unknown powders?	You could show them the pictures from this lab: https://www.tes.com/lessons/CSSx5QuARlcMFg/flame-test-virtual-lab or your own pictures of flame tests from old labs, then find different flame test images of the same substance.
12	Magnetism and atomic structure	What relationships exist between the electrons in a substance and the strength of magnetic attraction?	Not recommended
13	Density and the Periodic Table	What are the densities of Germanium and Flerovium	Not recommended

Chemistry

14	Molar relationships	What are the identities of the unknown compounds?	You could give images of the powders, chemical formulas for each, molar masses, and mass of the containers and the only thing they'd be missing is the lab skill practice of finding the mass themselves.
15	The ideal gas law	How can a value of R for the ideal gas law be accurately determined inside the laboratory?	Not recommended
16	Development of a reaction matrix	What are the identities of the unknown chemicals	Not recommended
17	Limiting reactants	Why does mixing reactants in different mole ratios affect the amount of the product and the amount of each reactant that is left over?	Not recommended
18	Characteristics of acids and bases	How can the chemical properties of an aqueous solution be used to identify it as an acid or a base?	You might be able to do a pared down version of this lab with the PH PHET lab, but it would be more "What makes something acidic or basic and how do volume and dilution affect that" and less "How can we use properties to ID acids and bases"
19	Strong and weak acids	Why do strong and weak acids behave in different manners even though they have the same chemical properties	Not recommended
20	Enthalpy change of solution	How can chemists use the properties of a solute to predict if an enthalpy change of solution will be exothermic or endothermic?	Not recommended

Chemistry

21	Reaction rates	Why do changes in temperature and reactant concentration affect the rate of a reaction?	There's a Java based PHET for this one, so it wouldn't be downloadable on all computers.
22	Chemical equilibrium	Why do changes in temperature, reactant concentration and product concentration affect the equilibrium point of a reaction?	Not recommended
23	Classification of changes in matter	Which changes are examples of a chemical change and which are examples of a physical change?	This one would be tough, you'd need to film the reactions or before and after for each combination. Not really recommended as they can't use odor
24	Identification of reaction products	What are the products of the chemical reactions?	This one you could do with pictures of the reactions
25	Acid-base titration and neutralization reactions	What is the concentration of acetic acid in each sample of vinegar	Not recommended
26	Composition of chemical compounds	What is the empirical formula of magnesium oxide	Not recommended
27	Stoichiometry and chemical reactions	Which balanced chemical equation best represents the thermal decomposition of sodium bicarbonate	You could give them the data for what happened in the thermal decomposition.
28	Designing a cold pack	Which salt should be used to make an effective but economical cold pack?	Not recommended

Chemistry

29	Rate laws	What is the rate law for reaction between hydrochloric acid and sodium thiosulfate?	Not recommended
30	Equilibrium constant and temperature	How does a change in temperature affect the value of the equilibrium constant for an exothermic reaction?	Not recommended