

The assignment.

Write an assessment narrative once the rotation is over. Include the following in the narrative:

- * the big idea and how it was connected to an ongoing study
- * how the rotation actually happened
 - o day by day (brief)
 - o adjustments
- * the multiple abilities tapped by each of your learning activities
- * your cards (activity, resource, individual report)
- * a list of pre/post assessment scores by child (use class list and be sure to * your identified children)
- * the average gain score for your class
- * a paragraph describing the learning behavior of each of the children you identified in the classroom structures assignment during the CI unit
- * your own personal reflection about what you learned as a result of teaching the children how to collaborate and then doing this collaborative activity with them. Be sure to include commentary related to your identified children.

Complex Instruction Assignment
Principles of Classroom Management
Spring 2003

This complex instruction rotation was part of a literacy-based science unit that focused on the human body. The unit theme was "Individual Parts Form a Functioning Whole." We began by studying cells, then cell division (mitosis), tissues, organs, systems, and finally, the human body as a whole that is dependent on all of its parts working together. The rotation activities gave the students hands-on experience with the first four topics: cells, mitosis, tissues, and organs.

Students were divided into four research teams of four or five students. Each research team was assigned a color: red, blue, green, or orange. Each person on the team then received a role tag of the color that corresponded with his or her research team. The roles assigned were leader, reporter, recorder, manager, and harmonizer. In the groups with only four students, the roles of reporter, recorder, manager, and harmonizer were shared. We spent about 10 minutes on each role, and then the students rotated to the next role. Some specific situations

We had been learning about group communication skills throughout the previous week during morning meetings. Each morning, I had asked the students to perform certain tasks as a group that required them to communicate with each other, devise a plan of action, and execute it. One activity was The Human Knot. Another activity required students to piece together two puzzles after each child was given one piece of a puzzle. They were not allowed to talk during this activity. After each activity, we spent a few minutes discussing which communication techniques worked and which were destructive. The students made some great observations about tone of voice, body language, the importance of everyone participating, and respectful ways to make suggestions. Therefore, the students were primed for this type of group work.

The Activities

Each station had a card that described the task and the requirements, and a separate resource card that provided content information and the requirements. The information on the resource card was a few pieces of information that would

With appreciation to
Ellie Cook, Class of 2003.

Excellent

write
this

The Big Idea

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excellent

Students were divided into four research teams of four or five students. Each research team was assigned a color: red, blue, green, or orange. Each person on the team then received a role tag of the color that corresponded with his or her research team. The roles assigned were leader, recorder, reporter, materials manager, and harmonizer. In the groups with only four students, the leader assumed the responsibilities of the harmonizer. We spent about 10 minutes discussing the types of duties that each role was responsible for, and then the students had some time to ask questions about (and role play) some specific situations.

We had been learning about group communication skills throughout the previous week during morning meetings. Each morning, I had asked the students to perform certain tasks as a group that required them to communicate with each other, devise a plan of action, and execute it. One activity was *The Human Knot*. Another activity required students to piece together two puzzles after each child was given one piece of a puzzle. They were not allowed to talk during this activity. After each activity, we spent a few minutes discussing which communication techniques worked and which were destructive. The students made some great observations about tone of voice, body language, the importance of everyone participating, and respectful ways to make suggestions. Therefore, the students were primed for this type of group work.

well do
Ellie.

The Activities

Each station had a card that described the task and the requirements, and a separate resource card that provided content information that would help them meet the requirements. The information on the research cards was a combination of material we had previously gone over in class as well as a few new pieces of information that would

enhance their understanding of the topic. I provided the familiar information because I did not want the students to be returning to their desks to find things in their binders that they could not remember. The new information on the resource cards was to help the children continue learning and working toward meeting the curricular objectives that needed to be taught during the three-week period. Some stations contained more new information than others, and seemed to be a little overwhelming for some students, particularly those who began the rotation at those stations. I would have preferred to focus the complex instruction activities on just cells because that is what the children were most familiar with, but due to time constraints, we had to progress forward into new material.

The first activity required students to build a labeled model of a human cell using play-dough, toothpicks, paper, scissors, masking tape, and a pen. This activity highlighted a couple of multiple abilities. The first was stable hands when manipulating small objects. Students had to use play-dough to build all of the parts of the cell, right down to the chromosomes and mitochondria, so they needed to build vary small objects and place them inside their model cell. The second multiple ability was to convert a two-dimensional diagram of a cell into a three-dimensional model. There was a diagram of an animal cell on the resource card that students studied when building the model. This not only required artistic talent, but also visual/spatial.

The second activity required students to make up a dance that represented the phases of mitosis. The materials they were given were a CD player, a CD that contained techno/ hip hop/ pop music, large paper, markers, a bed sheet, and masking tape. This activity was designed to highlight students with multiple abilities such as having rhythm and being able to visualize motions. Obviously, the students who were able to find the beat of the song and dance to the rhythm shined as performers in front of their classmates. Luckily, we had just finished a dance residency with Karen Amirault which gave them experience with dancing as a group to fast-paced music, so dancing to the beat was not too challenging for most of them. If someone couldn't or didn't feel comfortable, the groups worked around that. There was one boy who was unable to move to a fast-paced beat, so his group made him the nucleus so he could just stand there and wave his arms. The second multiple ability, being able to visualize motions,

How
useful
was this
couldn't
have a
better
turn

highlighted students who were able to read written descriptions of mitosis and look at diagrams, and then imagine how it would look in motion. This allowed the group to then convert these motions into a creative dance.

The third activity focused on tissues. I set up a cell lab in the classroom using the computer microscopes that I got from a grant. Students were provided with four computer stations, four unidentified tissue samples, paper, and colored pencils. Their task was to examine the tissue samples under the microscope then decide if each sample was from an animal or a plant. They were then to make a display that showed what they saw and how they classified each sample. The multiple abilities that this activity highlighted were: having steady hands and being able to draw with attention to detail. Because microscopes can be tricky to focus, a steady hand is needed to line the sample up and adjust the focus so that the tissue can be seen clearly. I also anticipated that students would be drawing what they saw under the microscope for their display. There were other ways to put displays together using the computer software that came with the microscopes, but I wasn't expecting them to use this since this was the first time they had experimented with the microscopes, and they hadn't had any instruction on how to use the software. Some groups drew what they observed, and this highlighted students who were able to draw with extreme attention to detail. However, to my surprise, most of the students were able to figure out how to use the special effects on the computer software, so some groups printed pictures of what they saw under the microscope, and others made a slide show set to rock music.

The fourth activity was focused on the first organ we studied: the human eye. Students were given a box containing balloons, saran wrap, aluminum foil, paper, scissors, markers, and glue. Their task was to create a labeled model of the eye that somehow described how the tissues worked together to let it function. The multiple abilities that this activity included were: having steady hands and being able to visualize information that is read. Steady hands were required to construct and attach small pieces of the model. Students were also required to read information about each tissue and its function in the eye. Though they were provided with a diagram of an eye, the diagram did not show how light travels through it. Students had to read about each tissue, and

then visualize them working together in order to come up with a description of how the eye works.

ACTIVITY 1

Build a Cell

Your Task

Use the materials on your table to build a model of a human cell. You may use information about cells and organelles from the resource card or information that you already know.

Requirements

- **Everyone must participate.**
- **Five or more organelles must be shown.**
- **Organelles and their functions must be identified and labeled.**

RESOURCE CARD

ACTIVITY 1

Cell membrane – encloses the cell and decides what passes in and out of the cell.

✓ Nucleus – control center of the cell. It contains the chromosomes, or DNA.

Cytoplasm – the gel that fills the space between organelles inside the cell.

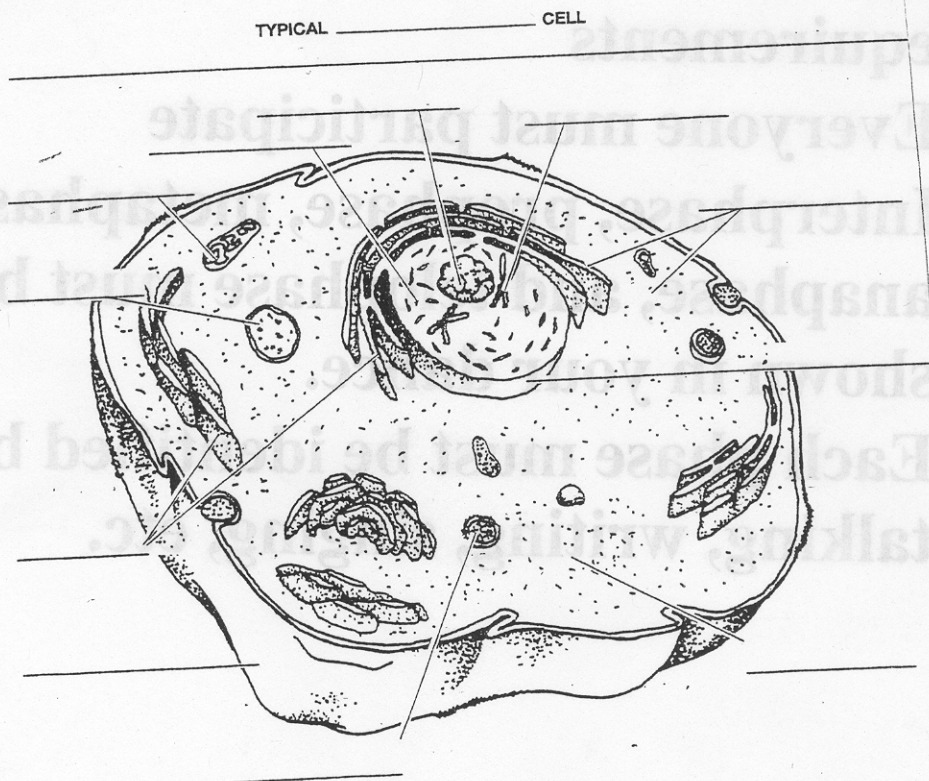
✓ Mitochondria – the power center of the cell. They provide the cell with energy needed to live and grow.

✓ Vacuole – storage place for nutrients or wastes.

Endoplasmic Reticulum – helps to make proteins.

Ribosome – small organelles that are both stuck to the ER and floating in cytoplasm. They help make protein.

- Human cells have 23 pairs (a total of 46) of chromosomes.



ACTIVITY 2

Musical Mitosis: A Dance Through Cell Division

Your Task

Your group must choose a song from the CD. Then you need to create a dance that represents each phase of Mitosis. You may use the materials on your table to create props or costumes. Remember what you learned from Karen Amirault!

Requirements

- Everyone must participate
- Interphase, prophase, metaphase, anaphase, and telophase must be shown in your dance.
- Each phase must be identified by talking, writing, singing, etc.

RESOURCE CARD

ACTIVITY 2

MITOSIS

The process of cell division

- There are five parts (or phases) of Mitosis. They go in the following order.

1. Interphase

The chromosomes duplicate inside the nucleus.

2. Prophase

The nuclear envelope disappears. The cell starts to get longer.

3. Metaphase

The pairs of chromosomes line up across the middle of the cell.

4. Anaphase

The chromosome pairs separate and move toward opposite ends of the cell.

5. Telephase

The cell membrane pinches off in the middle, separating the cell into two daughter cells.

ACTIVITY 3

Plant or Animal?

Your Task

Your group must use the computer microscopes to view each tissue sample. You must then decide whether each one was from a plant or an animal. Once your group has decided, you must create a display using the materials in your lab that shows how you classified each sample.

Requirements:

- **Everyone must participate.**
- **Each tissue sample must be classified in your display.**
- **Your display must explain what characteristics you used to determine whether the tissue was from a plant or an animal.**

RESOURCE CARD

ACTIVITY 3

- Animal cells and Plant cells have many of the same organelles, but there are two main differences.
- Plant cells are surrounded by a cell wall, which is more rigid than a cell membrane. This gives many plant cells a more rectangular shape than animal cells.
- Plant cells contain chloroplasts, which are important for photosynthesis. Chloroplasts are what make some parts of plants green.

ACTIVITY 4

Build an Eyeball

Your Task

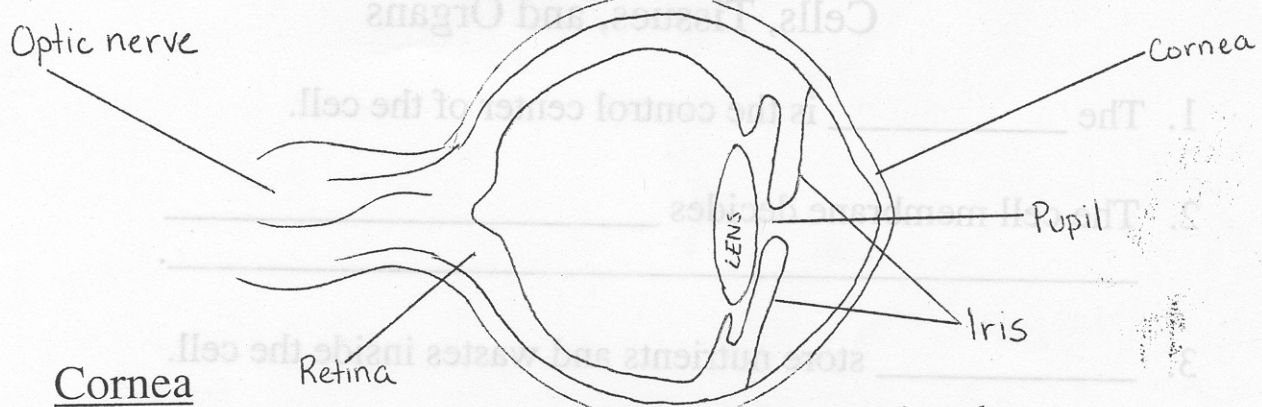
Use the materials on the table to build a model of an eyeball. You may use information on the resource card or information that you already know.

Requirements

- Everyone must participate.
- The eyeball must include the iris, retina, pupil, and lens.
- These tissues that make up the eye must be labeled.
- Your model must include a written description of how the eyeball works.

RESOURCE CARD

ACTIVITY 4



Cornea

Clear outer covering of the eye that directs light rays into the eye.

Pupil

Variable-sized black circular opening in the center of the iris that regulates the amount of light that enters the eye.

Iris

Colored tissue lying behind the cornea that gives color to the eye (for example, blue eyes) and controls amount of light entering the eye.

Lens

Transparent tissue that helps bring rays of light to a focus on the retina. It reflects what the eye sees to the retina upside-down.

Retina

Tissue in the eye that converts images from the eyeball to electrical impulses that are sent along the optic nerve to the brain. Somehow, the retina and the optic nerve rotate the image so the brain sees it right-side-up. Scientist are not sure how this happens.

Optic nerve

Largest sensory nerve of the eye. It carries impulses for sight from the retina to the brain.

Name _____ Date _____

Cells, Tissues, and Organs

1. The _____ is the control center of the cell.
2. The cell membrane decides _____
_____.
3. _____ store nutrients and wastes inside the cell.
4. During interphase, the chromosomes _____.
5. Mitosis is _____.
6. _____ is the final phase of Mitosis.
7. _____ make plant cells more rigid than animal cells.
8. Chloroplasts are in _____ cells.
9. _____ are in both plant cells and animal cells.
10. The _____ is the tissue that gives eyes their color.
11. The cornea is _____
_____.
12. When an image is reflected to the retina, it is seen _____
_____.

Assessment Scores:

Student	Pre-test Score	Post-test Score	Score Increase
W.B.	12	12	0
S.H.	28	84	56
K.J.	28	67	39
S.U.	52	88	36
M.G.	36	67	31
S.P.	28	80	52
M.W.	28	96	68
A.S.	46	84	38
A.B.	36	92	56
Z.D.	12	44	32
C.B.	36	75	39
G.V.	20	79	59
C.S.	36	75	39
M.T.	12	79	67
A.V.	0	20	20
B.B.		72	
S.W.		67	
Mean Average	27.3	69.5	42.1
Median Average	28	75	39

The assessments show that as a whole, the class learned quite a bit from these activities. In only four days, with about 30-40 minutes per day spent on this material, the mean average of the class' test scores rose from 27.3 to 69.5, a total of 42.1 points. More impressively, the median score rose from 28 to 75, a total of 47 points. The median score increase was 39, which indicates that half the class was able to increase their scores by 39 points or more.

Absoluted

Handwritten notes:
 W.B. was the only student who did not improve.
 M.W. was the student who improved the most.
 A.V. was the student who started with the lowest score.

Selected Individuals:

Following are the students that I identified during the status assignment and geared these activities toward. My original observations of these students that were included in the status assignment report are attached.

W.B.

The activities that highlighted W.B.'s strengths were those that incorporated the ability to visualize an image of written information, such as creating a dance to represent the phases of mitosis and building a model of an eye. I noticed that when W.B.'s group was creating the dance, he suddenly became a leader in group discussion and planning. It was during this activity that I told W.B. and his group, "[W.B.] is really good at imagining and acting out things that he reads. That will help your group make sense of the information on your resource card." W.B. directed the dance and performed the lead role, *Will Nye the Science Guy*. ✓

Though W.B.'s test scores indicated neither improvement nor any amount of subject comprehension as a result of the four activities (his test score remained at 12), I believe that he learned much more than the test scores reveal. W.B. is on an I.E.P. because he has an emotional/behavioral disorder that interferes with his academic performance. There are some days when he is not in a state of mind that allows him to sit down and successfully complete a test, or any form of written work. The day that the final assessment was given was one of those days. I know from my observations of W.B. working with his group that he not only has a good grasp on most of the content, but he also has grown socially in his ability to communicate with other students. This is something that I will take into account when determining final grades for this unit.

wonderful
And this is
a seriously
challenged
boy.

A.V.

A.V. was able to emphasize his strengths in activities that required steady hands for manipulating small objects. He was most successful in examining tissues under the microscope and building a model of a cell. When building the cell, he was able to construct several tiny blue pairs of chromosomes and place them inside a nucleus that measured about one and a half inches in diameter. While examining tissues under the microscopes in the cell lab, A.V. was the first in his group to line the sample up under the

light and adjust the focus so that the sample could be almost clearly seen. I helped A.V. get a sharper image, and then told his group, "[A.V.] is really good adjusting the focus knob just right so that the image is clear enough to see. That's going to help your group get a good look at each sample." Even after saying this, I still had to encourage other children in the group to seek A.V.'s help. However, I did notice that this was the activity that Andrew seemed the most confident with, and enjoyed the most. ✓

A.V.'s test score rose from a 0 to a 20. A 20-point increase is less than the class mean or median average increase, but as with Will, I don't believe that a written test was the best way to assess A.V.'s knowledge of this material. A.V. struggles with reading comprehension. With problems in his home-life increasing, he has become more moody and easily frustrated with challenging tasks at school. When he becomes frustrated, he takes on a "this is stupid and I don't care about it" attitude that hinders his academic performance. Though he is not on an I.E.P., my mentor teacher and I have been collaborating with his parents and the school counselor to set up a modified program for him. I don't know if this test reflects A.V.'s true improvement or if he found the written test too frustrating to give his full effort.

but still -
20 pts. is
20 pts.!

M.W.

M.W. is a student that is perceived as competent and popular by her peers. She has numerous strengths and abilities, but during these activities I wanted to take the emphasis off her strengths and allow her group members to shine. I wanted her to take an active role in ensuring that everyone's ideas were heard and that everyone had the opportunity to contribute to group decisions. I intentionally gave her the role of harmonizer. Her responsibility was to help the group identify and smooth out disagreements respectfully while making sure everyone got a turn to speak. She needed several gentle reminders from me that she was not the group leader; this was the role that she traditionally assumed. It also took time for her group members to recognize that M.W. was not going to just take over the projects and tell them what to do. I told M.W.'s group, "[M.W.] is a great listener. If she hears everyone's ideas, she can help your group determine where you agree and disagree." Though this still put her in a position of control, it wasn't a position of domination. ✓

M.W.'s test score rose from 28 to 96, a 68-point increase. Her improvement far exceeded that of the class mean and median average. Though this test indicates that this type of group work was beneficial for M.W., it is difficult to tell if it was purely the group activities that contributed to M.W.'s learning. M.W. is talented in multiple areas. She is an excellent student and absorbs information like a sponge. I think that she would have successfully learned the content of this unit if it were presented in numerous other ways. However, I now know that this type of group work is one way that M.W. can learn successfully.

and assist others...

M.T.

The multiple ability of M.T. that I had planned to highlight was her attention to detail when drawing. She is a very artistic, bright, academically successful student, but is not perceived so by her peers. She was able to demonstrate this ability when her group worked with the microscopes. While others in the group were struggling to figure out how to turn their images into a slide show, M.T. sat quietly, sketching what she saw on her computer screen with colored pencils. I told her group that M.T. is able to draw things that look very realistic because of her attention to detail, and this would give them another option for creating their display. The group did make a slide show, but they decided to hang the drawings that M.T. made on the bulletin board as the display they would show their peers.

M.T.'s score rose from 12 to 79, a 67-point increase. This increase was far above the class mean or median average increase. These scores, along with my observations of M.T. during the rotations, indicate that she learned a lot from each activity. M.T. is an excellent student, so she probably would have successfully learned the content material if it were presented in other ways, too. However, these group activities really gave her a chance to shine in front of her peers and build confidence. She was able to contribute her array of artistic abilities to the project at each station.

Reflection:

I think that this type of instruction was successful in my classroom in three main ways. First, it allowed for social growth and increased communication between students

at all status levels. This raised self-confidence and the sense of competence in those students at the bottom of the class status order. These activities were done toward the beginning of the unit, and I saw this new confidence in these students self-perceived academic competence carry on throughout the rest of the unit.

this is very significant!

This was most noticeable with W.B. and A.V. These two students frequently make themselves the butt of "stupid" jokes in front of their classmates. They know that their peers do not perceive them as smart kids, so by making jokes about themselves, and therefore beating the other kids to the punch line, they mask the fact that they are hurt by insults. During and after these activities, these two students rarely made comments about themselves during science time (though they did continue to make comments during other subjects). Instead of playing dumb, they were actively participating in group work. This was really nice to see.

wow!

The second way in which these activities were successful was that the class as a whole really enjoyed the hands-on, explorative nature. This was a pedagogical approach that worked really well for this group. They liked the idea of being on a research team, doing a different activity each day, and the predictability of knowing what activities they will be doing the following days. Since the rotations ended, the students have been asking if we could do more projects like what they had done in the complex instruction activities. During the rotations, they were excited about science time, and their enthusiasm enhanced the learning experience and quality of work that was produced.

The third way in which these activities were successful was that it is a great way to teach new and challenging material because it has multiple levels of learning and reinforcement. Because each group reports to the rest of the class each day, everyone is exposed to the information from each activity four times on four consecutive days, and often in a different way each time. Each day, the information that is presented from each activity becomes a little more detailed and accurate. The quality of the projects produced at each station improves each day because each group has advice and knowledge that was generated by other groups who had previously done the activity. By the final rotation, the quality of the projects had improved immensely from the first day. The groups provided scaffolding for each other.

After the rotations were over, it occurred to me that the whole fifth grade science/social studies program at this school is set up a lot like complex instruction in this way. There are four fifth grades, and there is a common one-hour block during each afternoon schedule that is for science or social studies. Each of the four fifth grade teachers teach a three-week science or social studies unit that each of the four classes rotate through. I noticed throughout my internship as the classes rotated through our Westward Expansion unit that the quality of work got much better with each class. At first I thought this was because I was getting brighter students, but then it occurred to me that the students who studied expansion later had the benefit of learning from their friends in other classes in advance, so they were starting at a different level of exposure. It's amazing how students will share certain things that they learned with their friends. For example, in the first class that studied expansion with us, only a few had heard of the Donner party. However, by the fourth class, almost everyone knew the details about what had happened to these people and how they were forced into cannibalism. Also, the fifth grades have break times during which they mingle in each other's classrooms. This time is often used to look at projects and student work/activities displayed in other classrooms.

It's clear that complex instruction is beneficial to students on several levels. It can also be used in several ways in the classroom, whether it is with one class for a single unit, or with several classes for an entire academic area. However, when it is used with smaller groups that work cooperatively on a single project, there is more social growth and communication between students with different social and academic statuses.

This is the principle of iterative redundancy in action! It works!

more on this

Wow!

Student Observations from Status Inquiry:

M.W. is a girl in the class who ranked first socially and second academically. This does not surprise me. She comes from a two-parent home, and I believe they have a higher income. She wears new and trendy clothing and often shares her accessories (hair ties, bracelets) with other girls in the class. She plays soccer and hockey, and she excels at both. She has won several athletic awards. She also excels academically. She is the first to raise her hand and offer answers, and she breezes through class work. She often hands her completed homework in before the end of the day that it is assigned. Though she is very focused during instructional time, she certainly "lets go" during free choice/fun times. She is not afraid to be reprimanded by teachers or adults and is often found running around in classrooms, wrestling/sparring with other girls (and sometimes boys), and shouting indoors. Overall, she is a confident, outgoing, athletic girl.

M.T. is a girl whose rankings really surprised me. She comes from a single parent, yet stable, home. She lives with her mother and spends an occasional weekend in Maine with her father. From what I have observed, her mother is very supportive of her and encouraging. She plays on the basketball team, but she is not an athlete. She is a tiny, quiet girl. She is very sweet and is well liked by her classmates, but because she is so quiet, she does not seem to have a lot of friends. This is why I was not too surprised to see her ranked 15th socially. However, I was shocked to see her ranked 14th academically. She is one of the brightest students in the class. She breezes through her class work with the same ease as M.W. She earns very high grades in all subjects. However, because she is so quiet and does not speak up as much in class, I do not think that her classmates are aware of how successful she is academically.

W.B. is a boy who ranked 16th both socially and academically. I predicted that he would be near the bottom for both. Though this class is friendly and accepting of everyone, if there was an outcast, it would be him. He comes from a two-parent home, and both parents are academically supportive. However, he is on an I.E.P. for emotional and behavioral problems and has an aid monitoring him all day. He has incredible mood swings and sometimes engages in behaviors that cause the other students to want to separate themselves from him, such as crying/throwing tantrums during class, picking his nose, throwing things in the classroom, and sometimes making very bizarre/random comments. He is currently undergoing a full psychological evaluation outside of school. His mood swings have a very negative impact on his academic success because when he gets in his "bad" mood, he refuses to do any work, participate in what is going on in the classroom, or cooperate with anyone. One thing that I've noticed is that the more he feels like an outsider, the worse his mood swings become. On my first day in the classroom, he mistook me for another aid that was there to watch him and he started crying, saying, "I'm just a regular kid! Why can't you all just leave me alone? I'm just a regular kid like everyone else!" Another time, he was seen crying in the hall by some fifth graders from another homeroom, and they started laughing at him. This sent him into a tizzy, and he locked himself (and me) in the project room and started screaming, "My life is over! I'm ruined! I'm now the least popular kid in the whole school!" He is very aware of his own social ranking, and that is a big cause of his mood swings. Unfortunately, it is a vicious cycle; the more drastic his mood swings, the more the children separate themselves from him.

A.V. is a student who has intrigued me since my first day in the classroom. He is a small boy whose parents have divorced, but they both live in the community. He lives with his mother but spends a large amount of time with his father, too. This boy has fascinated me because despite his obvious academic struggle (he was the lowest ranked academically), he always seemed to have friends. I knew that he did not have a high social status, but he seemed to have a circle of friends, unlike M.T. It goes to show that appearances can be deceiving (he ranked last socially, too) because though he appeared to be a somewhat socially confident child, conversations with his mother have shown me a side of him that I might not have seen. He started school early and is nearly a year younger than everyone else in the class. He never really caught up academically or developmentally. His mother mentioned that he told her that he "hung out" with kids in his class in school, but they were not really his friends. He would not invite them over to play outside of school. His only close friend that he sees outside of school is a fourth grader. Each year there has been discussion about retaining him, and each year it was decided that it would be best to allow him to go on to the next grade. Though he has made gradual improvements (both academically and developmentally), he is still far behind his classmates. The idea of going into middle school next year so far behind is causing several people to worry. We have started discussing retention again this year. A.V., his mother, and the classroom teacher believe that he would benefit from staying in elementary school for another year. He is in my math group, and from what I see academically as well as socially, I believe he

should be retained as well. His father and the guidance counselor believe that it would be too much of a blow to his ego after the slight improvement that have been made this year and want him to go to middle school. We will all continue to have meetings throughout the remainder of the year to track A.V.'s progress and make a final decision.