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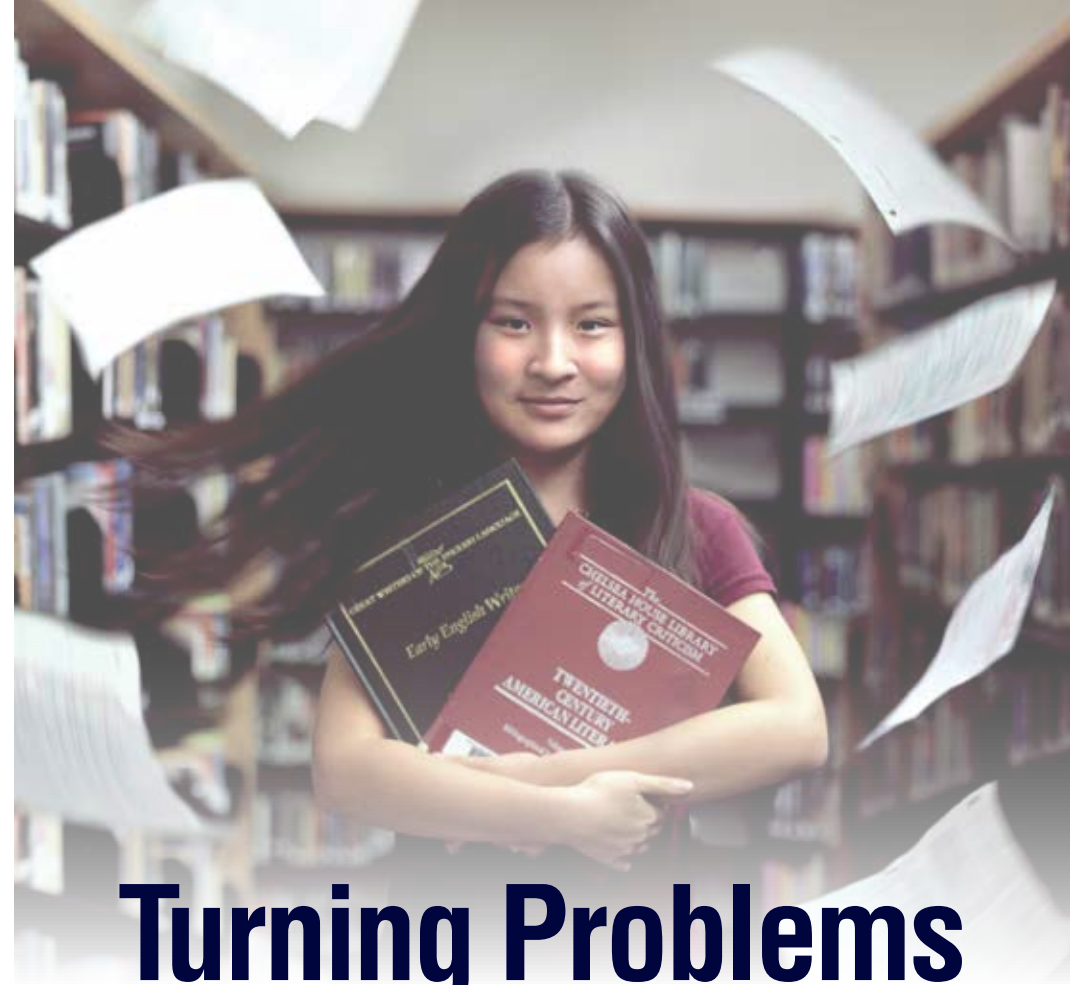
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Turning Problems into Possibilities

Unlock Students' Problem-Solving Potential

Students (and the rest of us) will encounter challenges and problems throughout our lives. Some of those will be challenges that we overcome in order to learn, grow or reach a new goal—a math problem or a fitness challenge, for example. Some of the challenges come through the everyday ups and downs of life—a rejection, an injury or a loss. Both can stop us in our tracks. Or they can be crucibles in which we learn and grow.

What can we do to help students get better at solving problems they encounter? Psychologists and neuroscientists have identified six keys to unlocking problem-solving potential that can help students both in and beyond the classroom:

- Know yourself
- Manage thoughts and feelings
- Break it down
- Think out loud
- Ask others for their opinions
- Encourage yourself

These strategies tap into extensive research on higher-order thinking (which includes executive function and metacognition). Rather than being set in stone, these abilities can be developed through a combination of teaching about how we think and practicing strategies to boost higher-order thinking.

This Renaissance Kit offers ways to work on both of these approaches. We hope they help your students become more self-reliant and strategic in solving problems they face.

—Kent Pekel, Ed.D.
President and CEO, Search Institute

"Asking for help does not mean that we are weak or incompetent. It usually indicates an advanced level of honesty and intelligence."

—Anne Wilson Schaef, psychologist and writer

Giving Motivating Feedback

Getting feedback is an important part of learning to solve problems. The way you give that feedback can make a big difference in how it will motivate (or deflate) students. Here are approaches to keep in mind that you can use when students seek your help in solving problems:

Care
Begin by showing that you are interested in the student. You care about her or his learning, growth and success.

Confidence
Be clear that you're giving feedback because you believe he or she can do it.

When and Where
Give feedback that's timely (but not before he or she is ready). Give it privately to avoid embarrassment.

Specific
Describe specific actions or behaviors you noticed that can be changed and practiced. Give concrete examples.

Strengths and Gaps
What was he or she doing that helped? What was getting in the way? Knowing both increases learning.

Listen, Then Share
Listen first for his or her ideas for steps to improve, then offer additional ideas.

Connect To Goals
Talk about the student's goals and how the actions helped achieve the goals.

Build Confidence
Reinforce the student's self-feedback and ideas for growth. This builds internal motivation and commitment.

Reaction
Pay attention to reactions. Does the feedback ring true? Does he or she understand? Is it overwhelming?

Doable
Don't overwhelm. Identify one or two changes that can make a difference now, and focus on those.

Repeat
As he or she tries new things, keep giving feedback that helps her or him grow. Celebrate progress along the way.

Research offers extensive insight into how people solve problems, including how the brain works and how decisions are made. Much of this research focuses on metacognition, or thinking about thinking. Here are some highlights that relate to the keys to solving problems that are the focus of this kit.

The Problem of Solving Problems

The process of solving problems is a complex, but vital challenge. In a time when, for the vast majority of people, work is not limited to routine tasks and manual skills, it is increasingly essential to be able to handle new situations, generate multi-step solutions to new challenges, manage complex information and adjust plans based on feedback.

The vast majority of workers today are confronted at least weekly with needing to solve a complex problem that requires at least 30 minutes to figure out. These skills are particularly in demand in managerial, professional and technical fields.

Yet a study of 510,000 15 year olds in 65 countries found that only 11% of study participants have the skills they need to solve complex problems. Furthermore, one in five can only solve simple problems in familiar situations. The good news is that problem-solving mindsets and skills — beyond the specifics of subject-matter problem solving — can be actively strengthened in schools, homes and other settings. Doing so prepares students to be successful, adapt, and thrive in a complex, changing world.

Getting Better at Thinking about Thinking

Sometimes when young people seem defiant or lazy, they may simply be experiencing symptoms of overloaded executive function systems.

Executive function, or the ability to think about thinking, isn't well developed in children, so young people can't process all the information they receive as quickly as adults. So sometimes they make decisions based on their impulses or first reactions. As they grow into adulthood, young people get better at self-regulating their actions and feelings, which contributes to declines in risk-taking behaviors.

Reducing the executive function demands on children, such as giving one direction at a time or removing distractions from the immediate vicinity, can allow young people to practice their developing executive function skills successfully. When they do that, they can learn more in the classroom because they are able to focus better on their teacher and their work.

Flexibility in Managing Emotions

Different people manage emotions in different ways in different situations. In their place, each of these approaches can be healthy and productive. For example:

- We can distract ourselves from the emotional information so that it doesn't capture too much of our attention. So we think of something else that is more emotionally neutral. This allows us to set aside the emotion until we can deal with it in a less stressful or emotionally intense situation or a less stressful time.

- We can reappraise the emotional information, which allows us to process the emotions more effectively. That is, we reframe the situation to make it less emotionally difficult. For example, a student may reappraise a low grade on a test by thinking of it not as an indication of failure but as a signal of what he or she can do to perform better in the future. The student could also use reappraisal to influence how he or she thinks about himself or herself after the test. For example, the student could think about other good grades that he or she has received in the past as a way to dispel fear that the low grade indicates limited ability to do well in the subject or in school in general.

Researchers at Stanford University found that people are more likely to pick reappraisal strategies when the situations are less emotionally intense. They are more likely to use distraction strategies when the issues are highly emotional. Researchers believe that flexibility in using the best strategy in a given situation is a key to emotional well-being.

"There are no big problems, there are just a lot of little problems."

—Henry Ford

Feedback: What Makes It Work

Solving problems often involves getting—and receiving—feedback. Educators see a key part of their role as providing feedback to students. Researchers find that this feedback is most likely to be constructive when the following are true.

1. Students **trust the person giving feedback.** Only then can they see criticism as information to help them improve, not resulting from bias, dislike or another motive.

2. The feedback **reflects the teacher's high standards and expectations**, not a bias.

3. Students believe **they can make the changes needed to succeed,** lessening the likelihood that the teacher doesn't really believe in them. This belief is reinforced through positive feedback on what they are doing well already.

4. Student must have **access to the resources** (which would include specific feedback) so they can achieve the standards they have set.

These feedback practices help all students, but they are particularly important for students who have faced biases or stereotypes. These practices, if used consistently, can enhance students' self-concept and performance, rebuilding a sense of trust in themselves and in others.

It Starts at Home

Young people are more likely to develop effective problem-solving skills when they feel listened to at home, participate in solving problems and making decisions, and have other family members who want to work together to solve problems. These dynamics are most likely when they have warm, supportive relationships with both parents and siblings.

By having these experiences at home, young people learn that disagreements and problems can be resolved in relationships. This gives them greater confidence in themselves and their interactions with others.

For more tools for families to build relationships at home, visit www.parentfurther.com.

The Importance of Self-Management to Achieve Goals

Young people who develop the skill to manage their own feelings and behaviors in order to achieve longer-term goals (known as "executive function") are better able than their peers to:

- Focus and learn in the classroom;
- Develop friendships;
- Go to college or get a good job; and
- Have fewer health problems than their peers who do not.
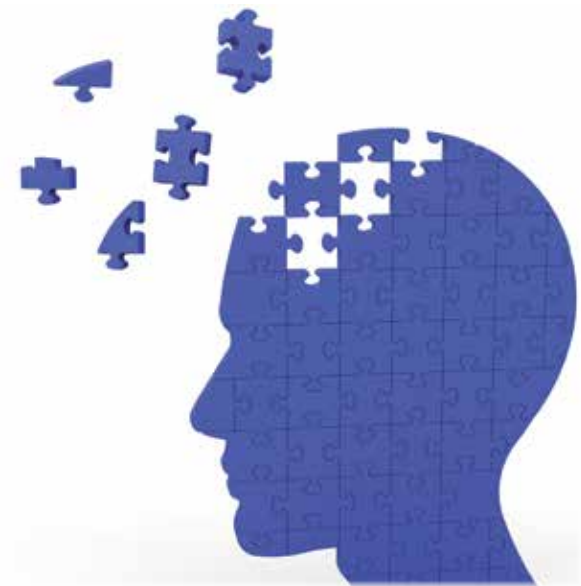
Whenever we start something new, we can be easily overwhelmed. There are so many things to learn and pay attention to—all at the same time. It's easy to act impulsively or just to barrel through, without really thinking through what's best. This activity helps students talk about what's happening in the brain when they're dealing with complex challenges, tasks, or goals. This understanding not only develops self-awareness, but it also opens up new ways to support and guide each other as we learn and grow.

Step 1
Set the stage by explaining that learning a little about air traffic controllers will help introduce us to some ways of looking at how people think through problems.

Step 2
Watch this short (2:35) video about air traffic controllers from the Discovery Channel: https://vimeo.com/49464060.

Step 3
After watching the video, discuss several questions:
- What parts of the video stood out to you?
- What did you notice that was surprising or interesting?
- What questions did it raise for you?
- What are some of the factors that make air traffic controllers' jobs unpredictable?
- Do you think you would want to do that job? Why or why not?

Step 4
Hand out (or display onscreen) the "Thinking Like Air Traffic Controllers" information sheet. Give students a minute to consider it, then discuss several questions:
- Where would you expect to see these three functions (juggling, switching and self-control) at work when air traffic controllers are on the job?
- Now think about how these skills (juggling, switching and self-control) are also important in everyday life, particularly when you are solving problems you care about. Can someone think of a problem that they had to solve, and describe what the three functions would look like for this example?
- Think of a future example where you will face multiple demands, like an air traffic controller does. Considering the three functions, what might you do to make sure that solving this problem goes better than it has in the past?

Step 5
If you have time, watch the air traffic controller video again. Ask students what they see this time that they didn't see before this discussion.

Additional Opportunities

- As an icebreaker before this discussion, have students make paper airplanes and fly them around the room until it becomes chaotic. Ask them why this experience feels so chaotic, then use the responses as a lead-in to the video.

- Tell a story from your own experience when you solved a difficult problem, and how you did it. Make it personal, so students can relate to your challenge and see themselves facing challenges and working through them.

Most people can tell stories about great coaches they've had. Some were called "coach" because they were with a sports team or other activity. Some were called teachers, uncles, aunts, neighbors or parents who knew how to "coach" well, or teach attitudes and skills that help us achieve goals. Some coaching techniques are things we can do for ourselves. This activity encourages students to think about what they've experienced from good coaches and then brainstorm how they might learn to "coach" themselves when they're dealing with problems or challenges. This activity can work in many different settings, but it can be particularly valuable in groups with coaches or mentors, such as sports teams, arts groups (drama, music), group tutoring programs or other co-curricular activities.

Step 1 **Distribute self-stick notes** so each student has three notes.

Step 2 **Ask students to remember three really good coaches they've had.** Explain that coaches are people who support you as you work to achieve a personal or team goal. Expand the idea of coaches to include sports coaches, but also other people who "coach." This could include mentors, parents, music instructors and other people who help us develop skills we need to achieve your goals. Have them write each name on a separate note and keep it for now.

Step 3 **Brainstorm** as a whole class some of the things these great coaches did that left a lasting impact on students. In other words, what made them really good coaches? Don't critique ideas, but generate as many as you can. Write each idea on a white board or flip charts where everyone can see them.

Step 4 **Choose some of the most impactful or helpful things coaches do** from the list. Circle these on the board. Have students post their self-stick notes with names of coaches next to one of the strategies that this coach did really well.

Step 5 **Ask students to think of ways they can do these same things for themselves**. This may take some creativity, so you might prime their thinking with some examples, such as the statements on the bookmark included with this Renaissance Kit.

Step 6 **Have students each choose one or two of these "self-coaching" strategies** that they think might help them most in solving problems they encounter. Remind them that different people need different kinds of coaching at different times, so their choices should fit what they believe will help them right now. Encourage them to write their coaching strategy in a place where they will be reminded of it when they need it.

Step 7 **Close by saying that self-coaching and positive feedback are important parts of problem solving.** In addition, they can turn to the great coaches they know and other people also to go to for guidance and encouragement in solving problems they face.