PROBLEM SOLVING

Whatever the problem may be, the following 7 step problem solving process should be applied. The steps should be followed in order. Do not jump ahead and try to come up with solutions until you know why the problem is occurring. Your solutions then address the *why*, not the presenting problem behavior itself.

1. Identify the specific problem(s)
2. Identify specific behavioral objective(s)
3. Assess the situation/ Gather as much relevant information as possible
4. Develop a hypothesis or educated guess as to why the behavior is occurring
5. Develop methods to address the problem and implement
6. Evaluate results
7. If desired results are not achieved, repeat as much of the process as needed.

Step 1: Identify specific behavioral problem(s)

Clearly state what you believe the problem(s) to be. Sometimes the problem isn't always what it appears to be, so this is an important step. For example:

- The bear exhibits abnormal/stereotyped pacing behavior

Step 2: Identify specific behavioral objective(s)

You need to know exactly what you are trying to achieve. State clear and specific objectives. For example:

- To reduce or eliminate the bear's pacing

Step 3: Assess the situation and gather relevant information

The first step is to determine why the problem is occurring. In order to develop a hypothesis or educated guess as to why a problem is happening, gather as much relevant information as possible. This is the step that may take the longest amount of time; it is also the most important. It is helpful to sit down with co-workers from different areas/departments as they will ask questions those directly involved may not consider. Different people have different experiences with the animal which can be valuable throughout the process. The following outline offers some information to consider when asking questions to thoroughly assess the situation – consider all factors surrounding the animal's environment – you never know what may end up being relevant.

1. Basic and chronological information
   - Any background information on animal(s) that is important, i.e. hand-raised, newly arrived, very submissive, prior training history, etc.
   - When, where, and how does the behavior occur
   - Who is present - human and conspecifics
   - How frequently does it occur, how long does it last, what is the intensity
   - Does it change at all over time
2. Environmental factors
   - Weather conditions
   - Abiotic features – water quality, water flow, lighting, temperature, humidity
   - Presence of novel or unfamiliar objects, people
   - New animals within range (consider species' sensory modalities)

- Unusual activities occurring nearby, construction, other human activities

Is there anything in the animal's environment that is influencing behavior? An examination of the area could reveal a foreign object nearby, a new addition to the display, unfamiliar people present, a certain weather condition (like wind), something familiar missing, or any number of other distractions. Sometimes even the smallest change can distract or frighten animals, so look carefully.

3. Training considerations - Is there something in the trainer's behavior?
   - Inconsistency by individuals and between individuals
   - Poor training that confuses or frustrates the animal
   - Steps too big or too small
   - Animal is uncomfortable with humans

   Is there something in your behavior that is influencing the animal? Are your signals clear, your bridges precise, and your reinforcers adequate and appropriate? Are you pushing too hard or moving too slow? Check your attitude, body position, voice, and physical movements for any inconsistencies that may be impacting the animal. Then ask the following questions: Am I confusing the animal? Am I intimidating or challenging the animal? Am I being consistent with my behavior in prior sessions? Am I personally distracted and therefore allowing some inappropriate emotions of my own to impact the animal?
5. Enrichment program considerations and questions -
   - Promote species appropriate behavior, behavioral biology and natural history
   - Scheduled, dynamic, use of 5 categories
   - Appropriate for individual's age, health, capabilities (too difficult or too easy)
   - Social dynamics or competition for enrichment or other resources a factor
   - How often are changes made to enclosures – fixed features and daily changes
   - Seasonality considerations
   - Enrichment goal-based considering all of the above and more
4. Facilities and operations
   - Rigid schedules
   - Not enough staff
   - Poor or inadequate facilities
5. Social dynamics
   - Dominant and/or submissive behavior involved
   - Reproductive or maternal behavior
   - Presence of new animal / absence of existing animal
   - Change in social structure – dominance struggle

   Is there anything happening in the animal's social system to influence his or her behavior, no matter how subtle? i.e. dominance, aggression, sexual activity, maternal behavior, and competition for human time and attention. For example: Is the dominant animal not allowing a subdominant animal to work? Is breeding activity distracting the animal? Is the female reluctant to leave her young?
6. Animal health issues
   - Animal is sick or physically injured
   - Does the problem involve changes in one behavior or in many?
   - Did the changes occur slowly over time or was a rapid onset seen?

- If in training, is the behavior difficult or physically taxing? Will the animal do other behaviors?
- Is the animal satiated or inappetant?

7. Animal's psychological state
   - Frustrated or fearful within environment (social, human, abiotic factors)
   - Bored
   - Resistant
   - Distracted
   - Confused or frustrated
   - Is or has the training experience been negative?
   - Is the behavior too difficult or unnatural?

   The animal's experience of training is important and will influence his or her behavior. Are training steps too small (boring) or too big (confusing and frustrating)? Trainer response to misbehavior appropriate – e.g., taking too many time outs, not considering social dynamics? Is the reinforcement appropriate to the task – e.g., too small, not valuable/preferred?

Step 4: Develop hypotheses - Why is this problem occurring?

Based on this information, make an educated guess as to why the behavior is occurring. It may be a single hypothesis or multiple hypotheses. The following demonstrates three potential hypotheses for the bear pacing example; these are derived after gathering information and based upon the most relevant info – NOTE: the example demonstrates how a single behavior could be caused by three very different sets of stimuli, and each would be addressed by different strategies. This is why info gathering and the subsequent hypothesis development is critical to do *BEFORE* leaping to solutions/strategies.

1) The bear paces because the enclosure offers little to do and is not engaging (aka 'bored')
2) The bear paces because the male bear is very dominant and limits her access to resources and generally makes her uncomfortable sharing the space.
3) The bear paces because of nearby construction (noise, vibration, visuals- equipment and people)

Step 5: Develop methods to address hypotheses

The methods developed to solve the problem should directly address the reasons why the problem is occurring - the hypotheses - not the problem behavior itself. As you can see in the bear example, each different hypothesis (reason "why") will have very different solutions. Choose methods that are reasonable, practical, and safe with sufficient resources (staff, staff time, supplies, equipment, etc.) to implement; use behavioral management elements as appropriate (PRT, Enrichment, Operational considerations, Facility design).

1) The bear paces because the enclosure offers little to do and is not engaging (aka 'bored')
   - Increase enrichment frequency; design enrichment to occupy time
   - Train the bears to shift into the holding area quickly and reliably any time of day so enrichment can be provided frequently and throughout the day
   - Use training sessions to provide mental stimulation and increase physical activity
2) The bear paces because the male bear is very dominant and limits her access to resources and generally makes her uncomfortable sharing the space.
   - Add visual screening and partial visual barriers to visually divide enclosure space

- Conduct socialization training to increase positive social interaction and reduce aggression, and to teach resource sharing
- Make sure that extra enrichment is always given so he is less likely to steal hers

3) The bear paces because of noises, vibrations, and associated activity of nearby construction.
   - Increase safe zones in all enclosures
   - Add noise dampening barriers
   - Give bear choice to go to holding or other areas of enclosure where she can escape construction regardless of time of day
   - Use training to desensitize her to the construction noise (better as preparation when you know construction is going to happen)

Once the methods are identified, decide how to implement. If the problem is severe, you may choose to do everything at once. This approach may address the problem quicker but won't identify how effective each individual strategy is. If understanding which approaches/strategies are most effective, you may try one strategy at a time to better determine what works best, or what doesn't work at all.

Use judgment on how long to try a specific method. Don't stay too long with a strategy that is not working, yet make sure you give it enough time to work. Keep in mind that problems don't typically occur overnight. When they develop more slowly and over time, solving them will likely require significant time and effort; problems with a more rapid onset may be resolved more quickly if the cause can be identified and addressed shortly after onset.

Step 6 Evaluate progress and results

Determine if the methods are working by evaluating progress and results, which can be done in several ways. First, keep good records, e.g. daily notes or specialized charts and data sheets. For example, with the bear problem, keepers could walk by the enclosure 4 times a day and simply record if the bear is pacing or not. If time, expertise, and resources are available, more formal assessments can help determine:

- If and when pacing occurs
- If pacing varies appearance, type, and intensity
- What specific factors seem to be related to pacing
- What other behaviors does the bear regularly do, when and where (activity budget)

Once the results from application of treatment strategies can be measured, determining the next steps will depend upon 1) If results are sufficient, continue with those methods AND continue to monitor for on-going efficacy. 2) If results are insufficient and the problem persists, you may choose to keep going awhile longer with strategies or return to the problem-solving process and loop through steps again. Note that when going back through the process, you can decide how far back to go – Do you need to reexamine the problem or the expected outcome? Do you need more information to better develop additional hypotheses? Or are there other strategies that may better address the original hypotheses?

The strength and value of this problem-solving process is rooted in the scientific method. It is a loop that can be repeated or worked through as many times as needed. So, if strategies aren't yielding desired outcomes, repeat as much of the process as needed and as many times as needed.

PROBLEM SOLVING EXERCISE

Gather a diverse group when possible – People who aren't involved with the problem daily will ask different types of questions which is helpful to gather broader scope of information.

1. **State the problem (one problem) clearly and simply**

2. **Identify specific behavioral objective(s)**

3. **Assess the situation and list relevant information**

4. **Hypotheses**

5. **Methods/Strategies (PRT, Enrichment, Facilities changes, Operational adjustments)**

6. **Assessment of results and Next steps**